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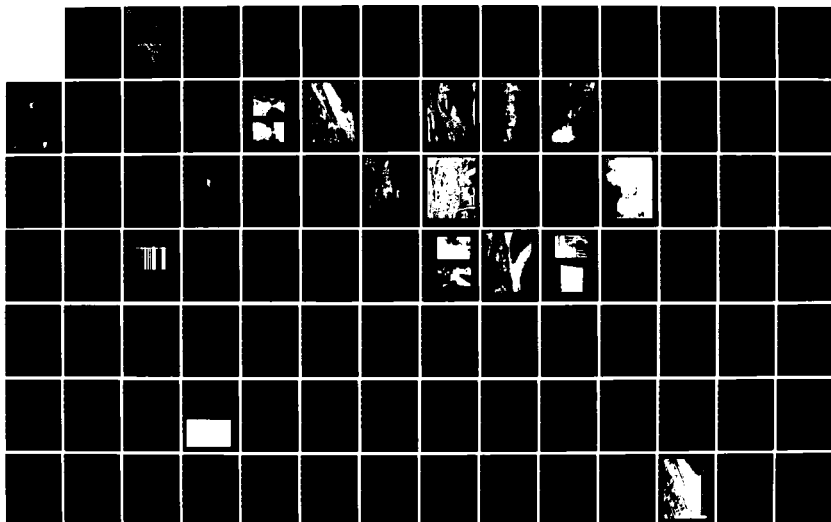
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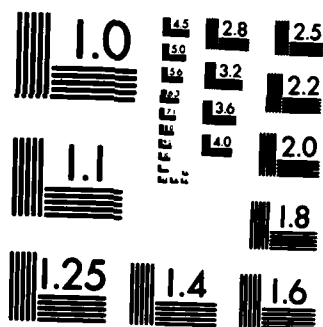
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FEASIBILITY REPORT
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STATEMENT

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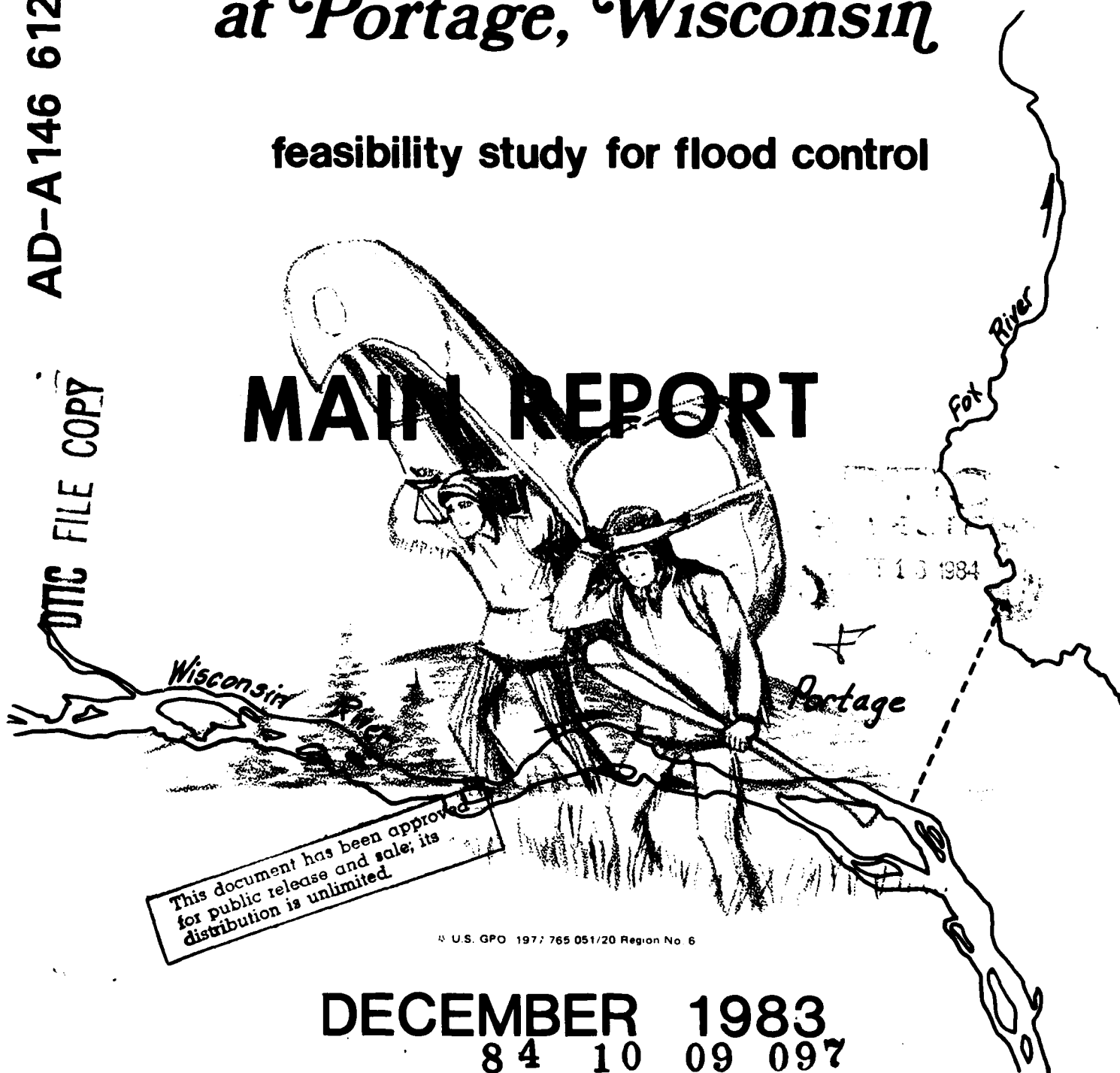
Wisconsin River at Portage, Wisconsin

feasibility study for flood control

MAIN REPORT

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basin in regard to the impacts of Wisconsin River overflows.

On the basis of intensive feasibility-scope investigations and extensive coordination with the public, it is recommended that the Corps of Engineers be the implementing agency for a local protection levee and floodwall plan at Portage. This plan was identified as the most economically feasible plan to construct. The Portage Lock, a historic landmark, would be incorporated to maintain the historic importance and character of the area.

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FEASIBILITY STUDY FOR FLOOD CONTROL
WISCONSIN RIVER
at
PORTAGE, WISCONSIN

December 1983

SYLLABUS

This report and final EIS (environmental impact statement) discusses potential solutions to the identified flood problems within Columbia County, Wisconsin River basin. The information contained in this report was coordinated with the Wisconsin River Flood Control Committee, Federal and State agencies, the city of Portage, and interested organizations and individuals.

On the basis of intensive feasibility-scope investigations and extensive coordination with the public, the District Engineer recommends that the Corps of Engineers be the implementing agency for a local protection levee and floodwall plan at Portage, Wisconsin. This plan was identified as the most economically feasible plan to construct. Main features of the plan include approximately 3 miles of levee, 550 feet of floodwall, 0.2 mile of road raise, road ramps, one railroad stop log closure, interior drainage facilities, recreation features, and aesthetic measures. The Portage Lock, a historic landmark, would be carefully incorporated into the project to maintain the historic importance and character of the area. In addition, it is recommended that Columbia County continue with the floodplain regulation, flood insurance, and flood forecasting and warning programs and that the Wisconsin Department of Natural Resources continue to maintain the remaining existing levees within the county.

The total project cost is estimated at \$7,938,000. Specific cost sharing and financing arrangements will be determined by the Chief of Engineers before project implementation. The benefit-cost ratio is 1.4.

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**WISCONSIN RIVER AT PORTAGE, WISCONSIN
FEASIBILITY STUDY FOR FLOOD CONTROL**

INTRODUCTION

The potential exists for a disastrous flood at Portage, Wisconsin, due to the topography of the area and previous attempts by various interests to modify the flood flow characteristics of the Wisconsin River in that area. Historically, the Wisconsin River, during periods of high flow, would overflow into the Fox and Baraboo Rivers in the vicinity of Portage. Beginning in the last half of the 19th century, local interests built levees to prevent this frequent overflow and flooding problem. The existing levees do not meet design standards of the Corps of Engineers or the Wisconsin Department of Natural Resources, and they could breach or overtop during any future flood event.

STUDY BACKGROUND

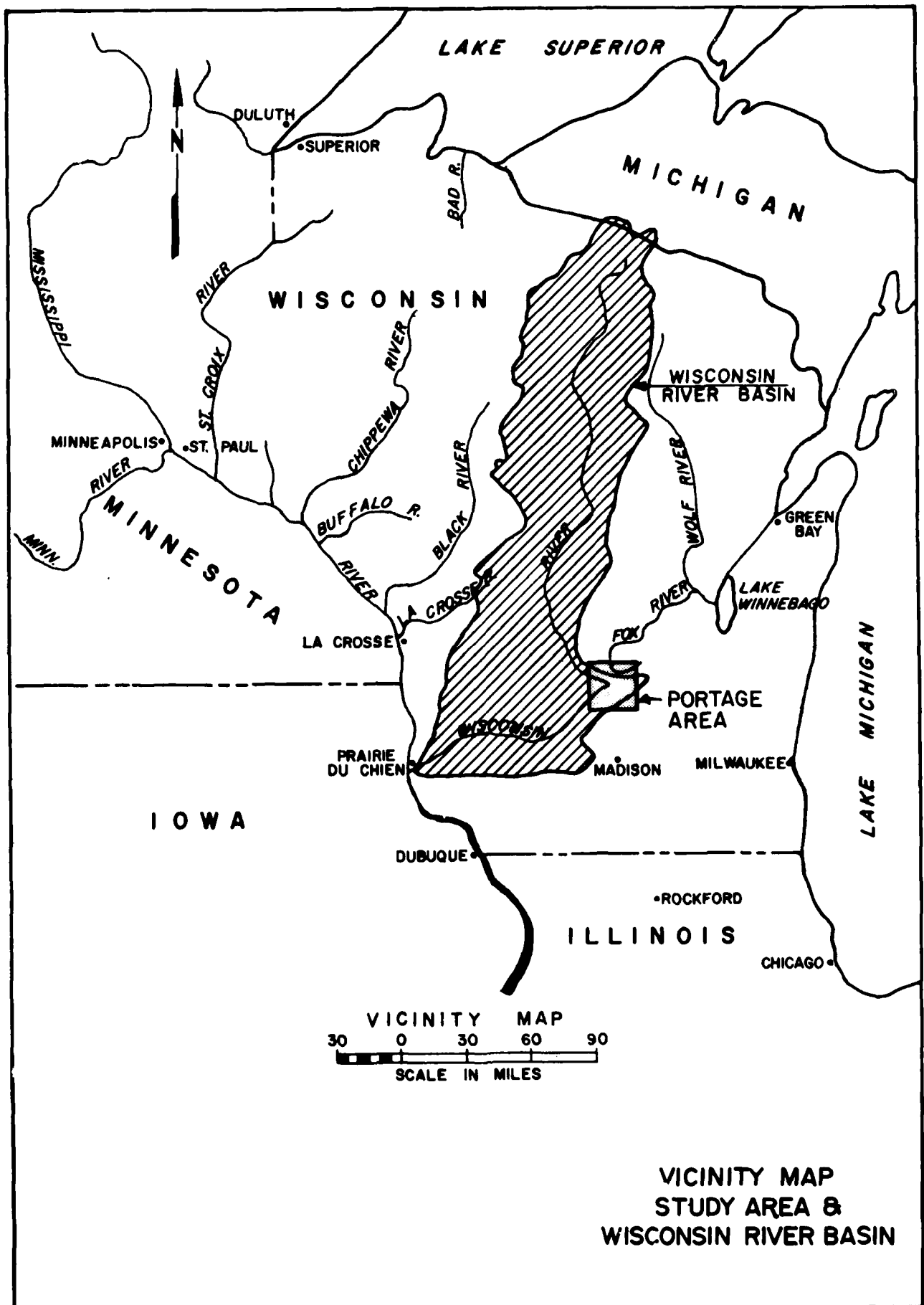
The present study was requested by the Wisconsin Department of Natural Resources because of concern for the floodplain related problems in the vicinity of Portage, Wisconsin. Authority was provided by a resolution adopted by the House Committee on Public Works, 14 June 1972. The resolution reads as follows:

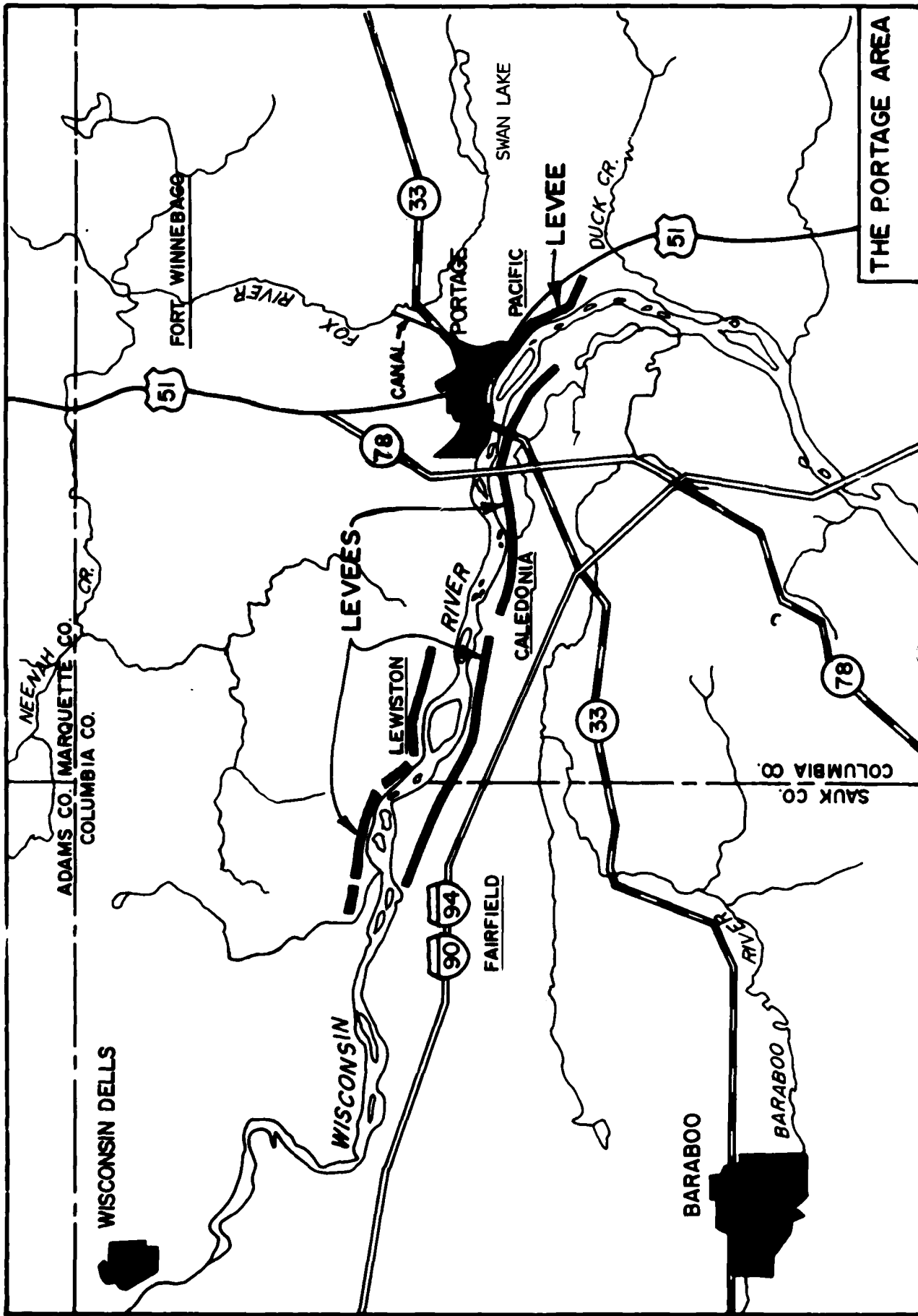
"Resolved by the Committee on Public Works of the House of Representatives, United States, that the Board of Engineers for Rivers and Harbors is hereby requested to review the reports on the Wisconsin River and tributaries, submitted in House Document No. 259, 71st Congress, 2nd session, with a view to determining whether the recommendations contained therein should be modified in any way at this time, with particular reference to improvements for flood control and allied purposes at Portage, Wisconsin."

Study funds were initially received in October 1976. Although prior studies of the Wisconsin River basin have been conducted, this study is the first comprehensive investigation of alternative flood control plans for the Portage area.

STUDY AREA, PURPOSE AND SCOPE

This study develops effective and acceptable alternative flood control plans for the Portage area which are consistent with the environmental and historic importance of the area. Included in the general study area (see the following figure) are those regions affected by Wisconsin River flooding and backwater flooding in the lower reaches of the Baraboo River and Duck Creek. Specifically, the study area encompasses the city of Portage; the adjacent townships of Lewiston, Caledonia, Pacific, and Fort Winnebago in Columbia County; and the township of Fairfield in Sauk County. Limited study was done on the upper Fox River basin in regard to the impacts of Wisconsin River overflows (see the figure on page 4).





THE PORTAGE AREA

Three study products were completed. Initially, a plan of study was developed in August 1977 which presented an outline of how the study was to be conducted along with identification of flooding and related problems and general discussion of flood control alternatives. An alternatives report was then published in January 1981. This report concentrated on data collection, identified specific problems and problem areas, and provided preliminary formulation of all possible alternatives. This report is the third product. It concentrates on those solutions identified in the alternatives report which were worthy of additional study and identifies a selected plan based on the more detailed study effort.

PRIOR STUDIES

Although this study is the first comprehensive investigation of alternative flood control plans for the Portage area, several other studies of flood problems in the Wisconsin River basin have been completed. The results of these earlier studies are described below.

A preliminary examination report of the Wisconsin River and its tributaries was submitted to Congress on 17 January 1930. The report was subsequently published in House Document No. 259, 71st Congress, 2d session. After investigation of potential navigation, power, flood control, and irrigation needs, the report concluded that any improvements on the Wisconsin River lacked economic justification at that time.

A preliminary examination report completed on 30 March 1944 reevaluated flood control needs on the Wisconsin River. The report recommended that a survey of the basin be undertaken with a view toward developing a program for flood control.

A review survey for flood control on the Wisconsin River resulted in a letter report dated 28 January 1955. It recommended no further action.

At the request of the Wisconsin Department of Natural Resources, the Corps conducted a reconnaissance study under the authority of section 205 of the 1948 Flood Control Act, as amended. The report, completed in November 1971, determined the feasibility of local flood control improvements on the Wisconsin River in the vicinity of Portage. It indicated that strengthening, raising, and extending the existing Portage and Lewiston levees appeared to be the most feasible flood control plan. No action was recommended for the existing Caledonia levees. Because construction costs greatly exceeded the \$1 million limitation for Federal expenditures under the small flood control project authority, the report recommended continuing the study under the survey investigation program. This report is the result of this recommendation.

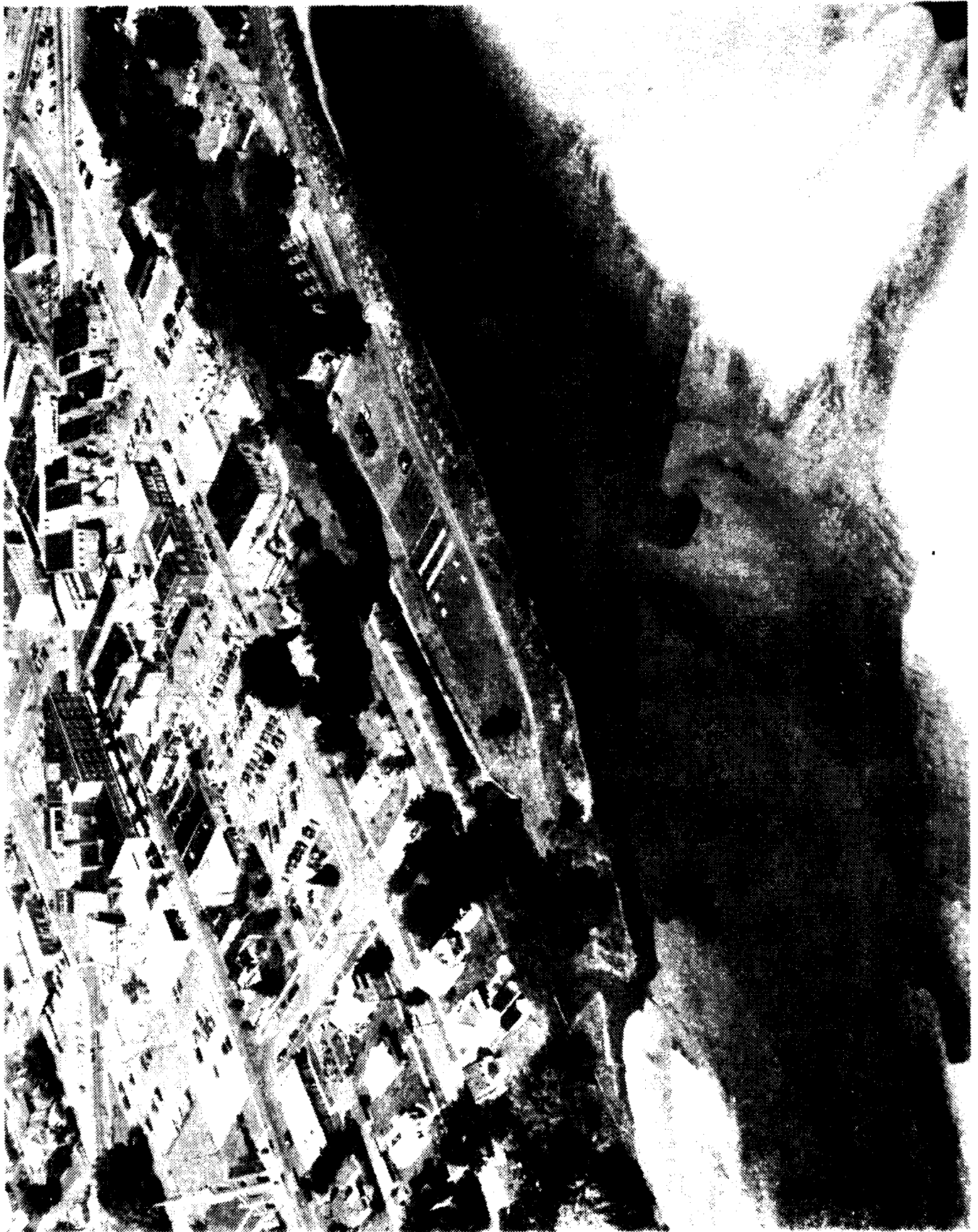
A report titled "Flood Plain Information on Wisconsin River in Vicinity of Portage, Wisconsin," was completed in June 1972. It described past floods and estimated the extent of probable future floods. It was intended to serve as a guide for developing future floodplain regulations. This document used standard procedures in developing the floodplain analysis. However, because of the complex hydrologic and hydraulic nature of the basin and the controversy in the area regarding floodplain regulation, a much more detailed analysis was made for the present study by the U.S. Geological Survey, the Wisconsin Department of Natural Resources, and the Corps. This analysis is presented as the Hydrology and Hydraulics Appendix, dated 30 July 1980. Using the results of that analysis, the Federal Insurance Administration of the Federal Emergency Management Agency completed a flood insurance study for Portage and Columbia County. The study divides the Portage area into zones according to potential flood risk. The results of the study will be used as a guide for determining insurance rates for properties in the floodplain. A report with these results has been prepared and the flood insurance study was adopted in 1983.

HISTORY OF EXISTING WATER PROJECTS

The history of water projects in the study area dates back to the territorial days. In the 1830's construction was begun on a canal at Portage which would serve as a link between the Wisconsin and Fox Rivers. The value of the canal was for military transportation, communication, and commercial navigation. When completed in 1876, the canal was 75 feet wide, 7 feet deep, and 2 1/2 miles long, with a lock at each end. During the last quarter of the 19th century and the early part of the 20th century, the canal was used extensively by steamers, smaller craft, and government boats. Although the canal still exists, it is no longer used for navigation. Historic and current pictures of the Portage Lock and Canal area are presented on the following figures.

Historic Pictures - Portage Lock and Canal
Portage, Wisconsin





Present Portage Lock and Canal
Portage, Wisconsin

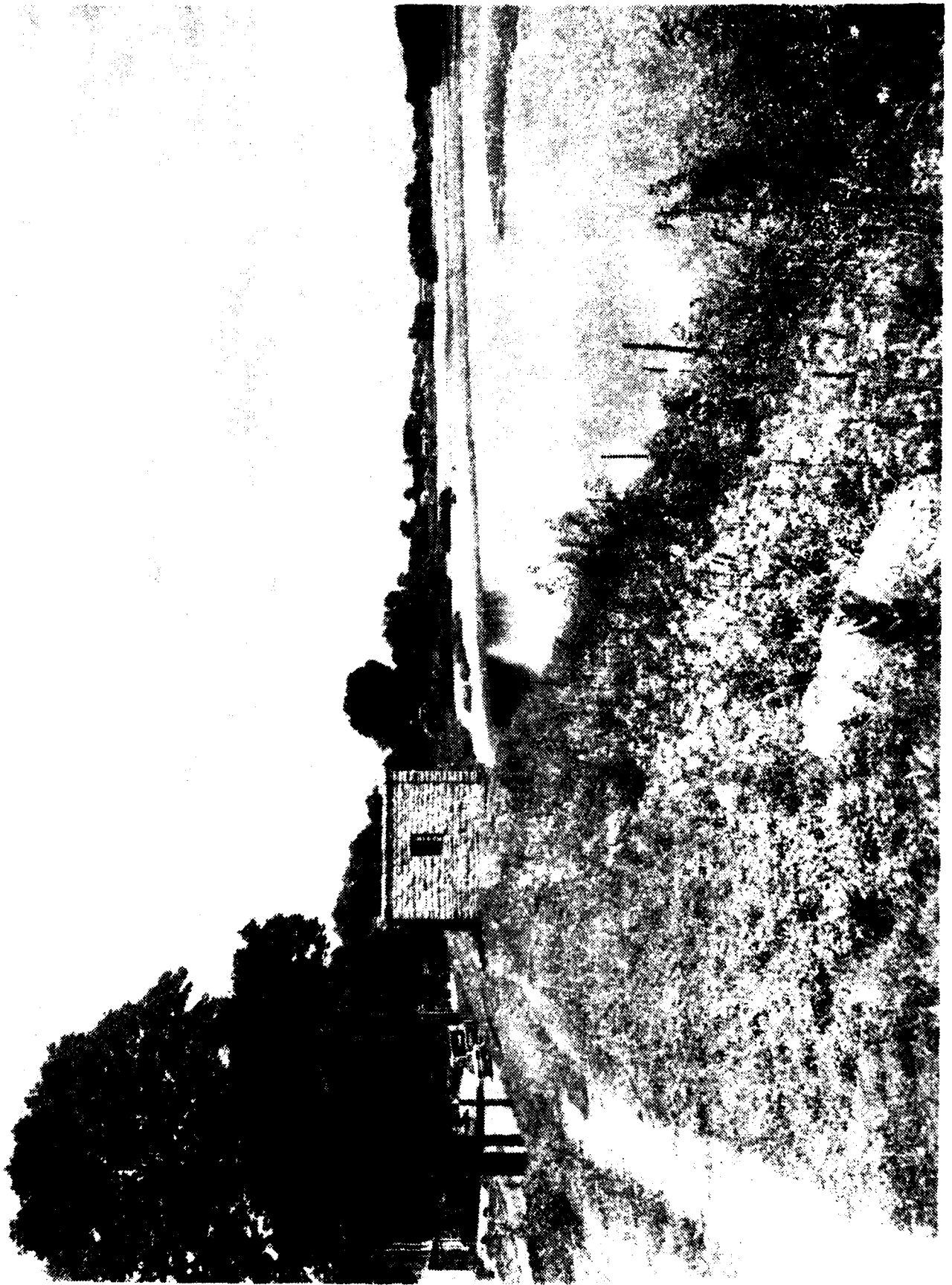
As early as 1861, local interests in the vicinity of the town of Lewiston constructed 4 miles of flood control levee. Failure of these levees in 1880 and 1881 resulted in a joint repair effort by the town of Lewiston, the State, and the Federal Government. Also at that time, Portage authorities constructed a small levee along Wisconsin Street in the Ward 1 area. By 1885 the city of Fairfield and townships in Caledonia constructed an additional 8 miles of levee on the south bank of the Wisconsin River to protect lands to the south and east. Between 1885 and 1901, additional levees were constructed in the Portage and Caledonia areas.

In 1901 the Portage Levee Commission was established to maintain and extend the levee systems. The Levee Commission was abolished in 1961 and its duties were made the responsibility of the State of Wisconsin. Through a program of periodic construction and continued maintenance, the flood protection system today consists of 18 miles of discontinuous sand levees located on both sides of the Wisconsin River upstream and downstream from Portage. The following figures show a general view of these levees as they exist today.



SWITCH TOWER
AND THE TOWER OF THE





Portage Levee and old levee patrol station
near Portage Canal Lock

PLAN FORMULATION

The plan formulation process involves an assessment of water and related land resource problems and opportunities, description of alternative measures designed to meet the identified problems, screening of those measures, refinement of those alternatives considered for further evaluation, and selection of a final plan. Each of these formulation actions is discussed in subsequent paragraphs. An important consideration in each action was coordination with the public and the study guidance provided by such coordination.

PROBLEM ASSESSMENT

Problems were identified by addressing public and agency concerns and assessing and analyzing the water and land resources of the basin. Past studies, published reports, meetings, correspondence, and discussions were important in the overall assessment of the problems and opportunities specific to the study area. A profile of the existing and anticipated future resource base provided a basis for this assessment.

PROFILE OF RESOURCE BASE (EXISTING CONDITIONS)

This profile of the resources in the study area describes the existing conditions in the basin. Pictures are incorporated to provide a better understanding of the overall area.

Physical Setting

The study area is in Columbia County, approximately 40 miles north of Madison, Wisconsin (see earlier figures). This area extends from the Columbia-Sauk County line (river mile 122) near Lewiston downstream through Portage to the Interstate 90-94 bridge (river mile 106). Because of backwater and overflow effects of the Wisconsin River, however,

portions of the tributaries of Duck Creek and the Baraboo River and part of the upper Fox River basin are also included in the study area. Portage is the only major community within the study area.

The study area is part of the Wisconsin River basin, which is located in central Wisconsin with a very small portion of the headwaters extending into Michigan. It is the largest basin in Wisconsin, with a total drainage area of 11,730 square miles or approximately 21 percent of the State's land area. The drainage area above Portage is about 7,940 square miles.

The source of the Wisconsin River is a network of interconnecting lakes and swamps, known as the Lac Vieux Desert, near the Wisconsin-Michigan border. From this point the river flows south, winding first through heavily forested lands and then through agricultural land. Approximately 220 miles from its origin, the river cuts deeply through soft sandstone. The topography in this region is typified by the Wisconsin Dells, an area widely known for its scenic beauty. Here the river contracts from one-third mile to as little as 50 feet in width, bounded on both sides by high sandstone bluffs. Immediately below this narrow reach it widens again, swinging east to Portage. Turning abruptly to the southwest below Portage, the river flows into the Mississippi River just south of Prairie du Chien, Wisconsin.

The study area includes one major tributary, the Baraboo River (drainage area 650 square miles) which joins the Wisconsin River about 3 miles south of Portage.

The only other principal river draining the study area is the Fox River. Rising in northeastern Columbia County, it flows southwest toward Portage. Here (with a drainage of about 100 square miles) it turns northeast, flowing through a series of lakes to Lake Michigan. At Portage, the Fox and Wisconsin Rivers pass within 2 miles of each other;

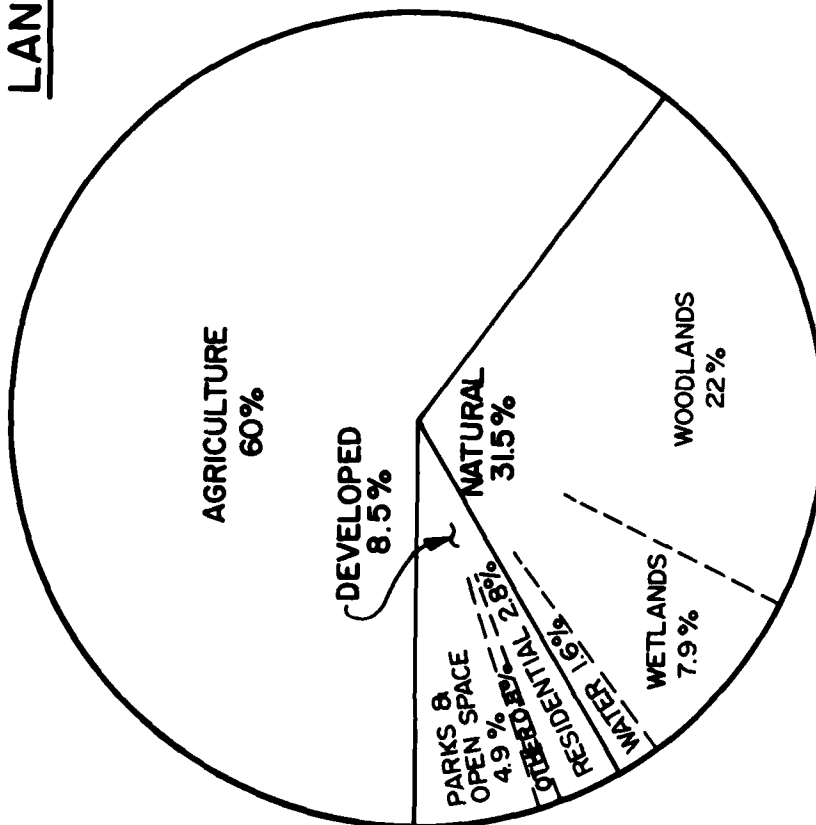
they are connected by the Portage Canal and separated by levees and level ground. The water of the Wisconsin River normally runs about 6 feet higher than that of the Fox River.

The topography of Columbia County varies from level black prairies to the rugged hills of the Baraboo Range in Caledonia. Elevation ranges from about 780 feet to over 1400 feet above sea level. The north central portion of the county is within the central sand plain formed when glaciers dammed up the Wisconsin River, creating glacial Lake Wisconsin. Upland waters drain into numerous ponded valleys, lake beds, and lakes. From these areas the water is carried by slow streams to the larger rivers such as the Wisconsin, Baraboo, and Fox Rivers. Scattered throughout the study area are many marshland areas. The largest wetland area is located between the Fox and Wisconsin Rivers just east of the Portage Canal.

Land Use

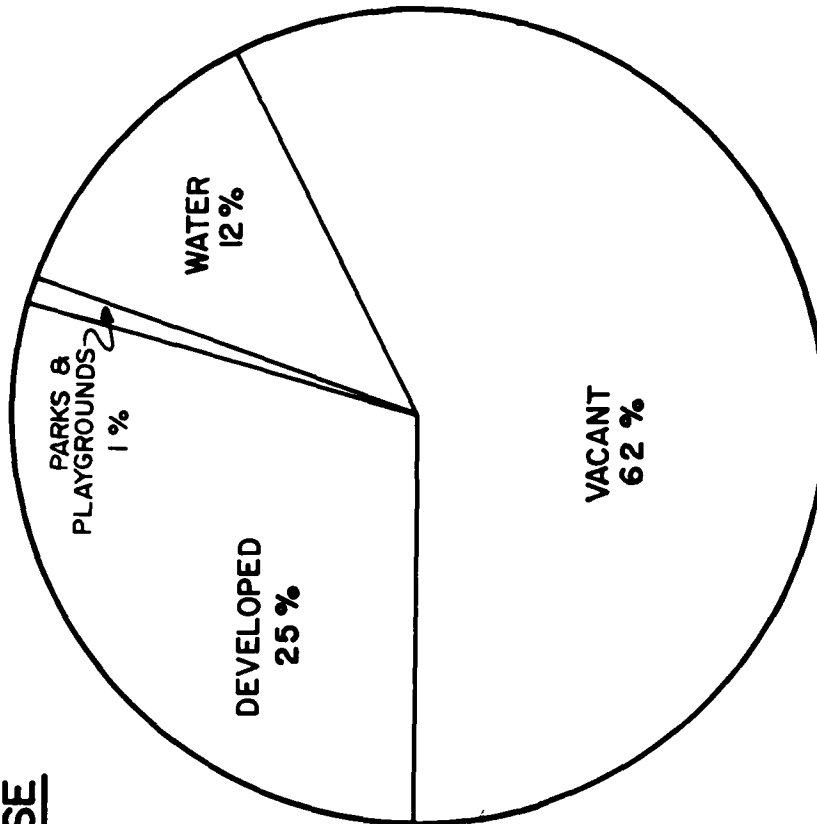
Much of the area surrounding Portage is rural. The predominant land use (60 percent) is agriculture followed by natural undeveloped areas. Scattered throughout the region are small residential developments. The following figure shows a breakdown of the land use distributions for the city of Portage and the four adjacent townships.

LAND USE



LEWISTON, CALEDONIA, PACIFIC & FORT WINNE - BAGO TOWNSHIPS

SOURCE: EXISTING LAND USE, REPORT NO.2, COLUMBIA COUNTY PLANNING DEPT. 1970



CITY OF PORTAGE

SOURCE: EPA ENVIRONMENTAL IMPACT STATEMENT, WASTE WATER TREATMENT FACILITIES FOR PORTAGE, WISCONSIN, 1980

Agricultural lands include cultivated lands, pasturelands, and pine plantations. Natural areas include floodplain forests, oak-hickory forests, mixed succession forests, wetlands, swamp forests, and mixed grasslands.

Within Portage, about half the land is vacant and most of the developed residential land is located around the local business center. Newer residential areas can be found north and east of the center. Recently, increased development has been taking place in the northwest, with most of the new housing starts in this area. Much of the remaining land is either very swampy as a result of a high water table or located in the Wisconsin or Fox River floodplain.

Climate

The climate is continental - that is, typical of the center of the continent in the middle latitudes. Although seasons vary widely from year to year, the area typically has long, cold, snowy winters and warm, and occasionally humid, summers. Average monthly temperatures range from 20° F in January to 74° F in July. The growing season averages 165 days.

The average annual precipitation is about 30 inches. Approximately 55 percent of this total falls from May through September. The rainfall is evenly distributed, providing sufficient moisture for crops during the growing season. The average annual snowfall is 41 inches.

Environmental Resources

A variety of game and nongame animals is found in Columbia County. All of the game mammals are permanent residents and include muskrat, beaver, red fox, and otter. Nongame mammals include porcupine, chipmunk, red squirrel, and pocket gopher.

At least 232 species of birds have been recorded in Columbia County. Some of the county's best bird habitat is near Portage. Game birds include pheasant, grouse, quail, and several types of waterfowl and shorebirds. Nongame birds include a variety of water birds, songbirds, and birds of prey. The Wisconsin River floodplain immediately west of Portage contains some of the best floodplain woods along the river. Floodplain woods provide nesting habitat for species such as the red-shouldered hawk, barred owl, and wood duck. Bald eagles make some winter use of the study area. Peregrine falcons have nested near Lake Wisconsin in the past. The Swan Lake section of the Fox River contains a mix of marsh, prairie, woods, and open water which provides excellent habitat for a number of species including marsh hawks. The area west of Portage and immediately north of the Wisconsin River contains some of Wisconsin's most productive sandhill crane habitat.

Many of the State's 174 species of fish can be found in Columbia County. A very good sport fishery exists in and near the study area for a number of game fish, including walleye and muskellunge. Though the fishery once provided an important food source, recreational use has now exceeded the commercial value of the fishery.

Threatened and Endangered Species

The U.S. Fish and Wildlife Service and the Wisconsin Department of Natural Resources have classified the following project area species as threatened or endangered.

U.S. Fish and Wildlife Service

Endangered

American peregrine falcon (Falco peregrinus anatum)

Arctic peregrine falcon (Falco peregrinus tundrius)

Wisconsin Department of Natural Resources

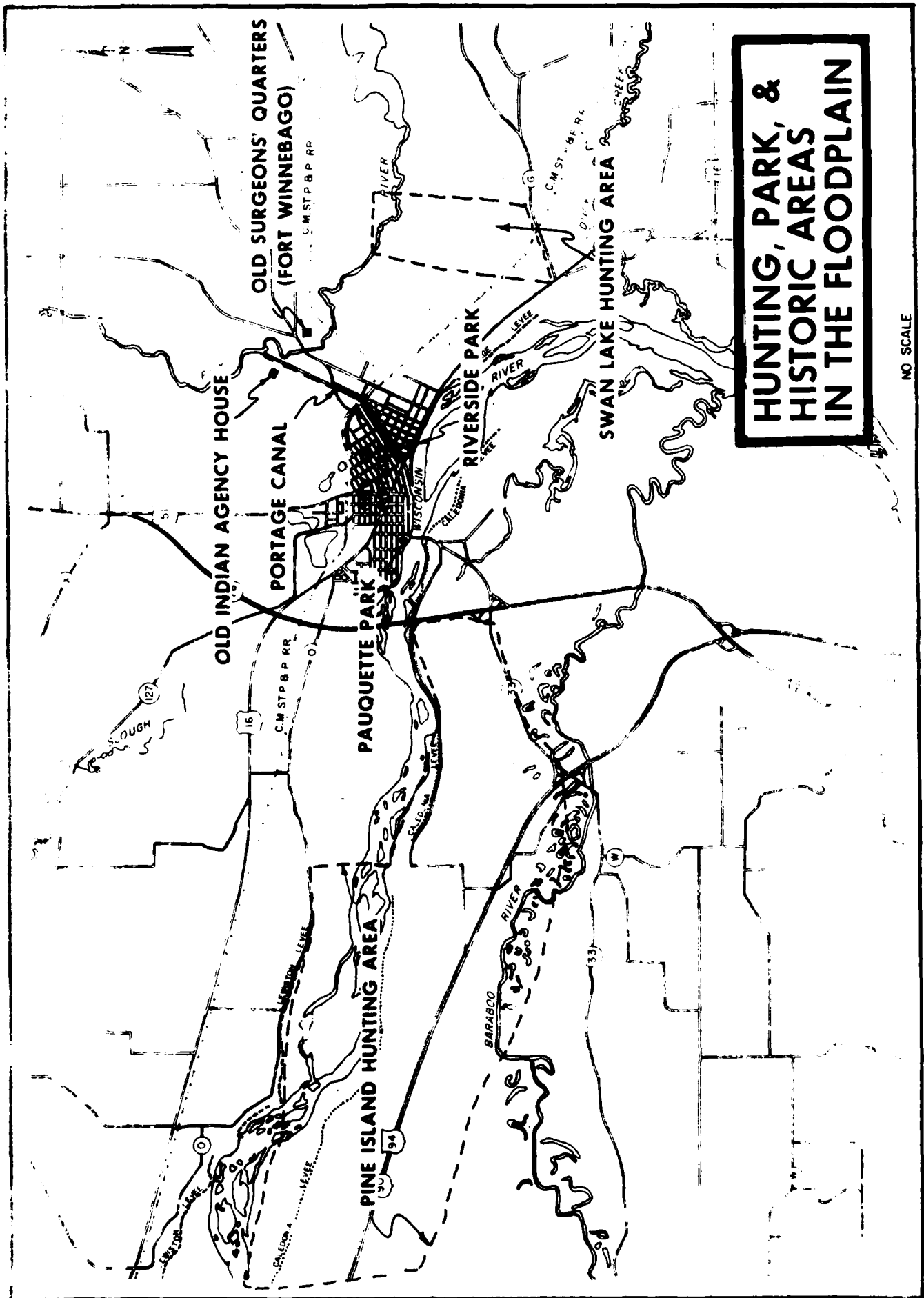
Threatened

Red-shouldered hawk (Buteo lineatus)

Speckled chub (Hybopsis acstivalis)

Black buffalo (Ictiobus niger)

Several important natural areas are located within or near the study area. The Wisconsin Department of Natural Resources maintains the Pine Island Wildlife Area and Swan Lake Hunting Area (see the following figure). The Leopold Memorial Preserve is located just upstream from the Pine Island Wildlife Area.



**HUNTING, PARK, &
HISTORIC AREAS
IN THE FLOODPLAIN**

NO SCALE

Human Resources

The human resources of the study area can be described by population, education, employment, economic, recreation, cultural, and transportation characteristics.

Population. - The historic and projected populations of Portage, Columbia County, and the State of Wisconsin are presented in the following figures.

Historic populations in Portage, Columbia County, and Wisconsin⁽¹⁾

Location	Year			
	1950	1960	1970	1980
Portage	7,334	7,822	7,821	7,896
Columbia County	34,023	36,708	40,150	43,222
Wisconsin	3,434,575	3,951,777	4,417,731	4,705,767

(1) Bureau of the Census, U.S. Department of Commerce.

Projected populations for Portage and Columbia County

Location	1985	1990	1995	2000
Portage ⁽¹⁾	NA	8,560	NA	8,790
Columbia County ⁽²⁾	47,340	50,370	52,950	54,950

(1) Past trend line of Portage as a percentage of Columbia County.

(2) Projections are from the Wisconsin Department of Administration.

The population in Portage and the adjacent townships has been stable or slowly increasing since 1970. The maintenance of the population and slow growth in the area can be attributed to continued strong desire by many persons for country living. The problems of the large cities have left many people disenchanted with the urban way of life. Because Columbia County is within commuting distance of the Madison area, people from that

area are taking up residence throughout the county. Despite this, the county's population density is still much lower than the average for the State.

Employment and Economic Status. - Portage lies in a primarily agricultural area and serves as a regional marketplace. Over the past three decades, employment has been shifting from agriculture to manufacturing. This increase in manufacturing in the area with more job opportunities becoming available is a healthy sign of economic stabilization.

Average unemployment rates for Portage are lower than those for other Wisconsin counties. Per capita income for Portage is higher than that for Columbia County or the State, while the percentage of Portage families with incomes below the poverty level is lower than that of the State. The following figures show the Portage central business district and several manufacturing businesses located along the Portage Canal.





Manufacturing along the Portage Canal

Per capita incomes for the sparsely populated townships of Caledonia, Lewiston, and Fairfield are significantly below the State figure, while per capita incomes for Pacific and Fort Winnebago Townships are approximately equal to that for the State.

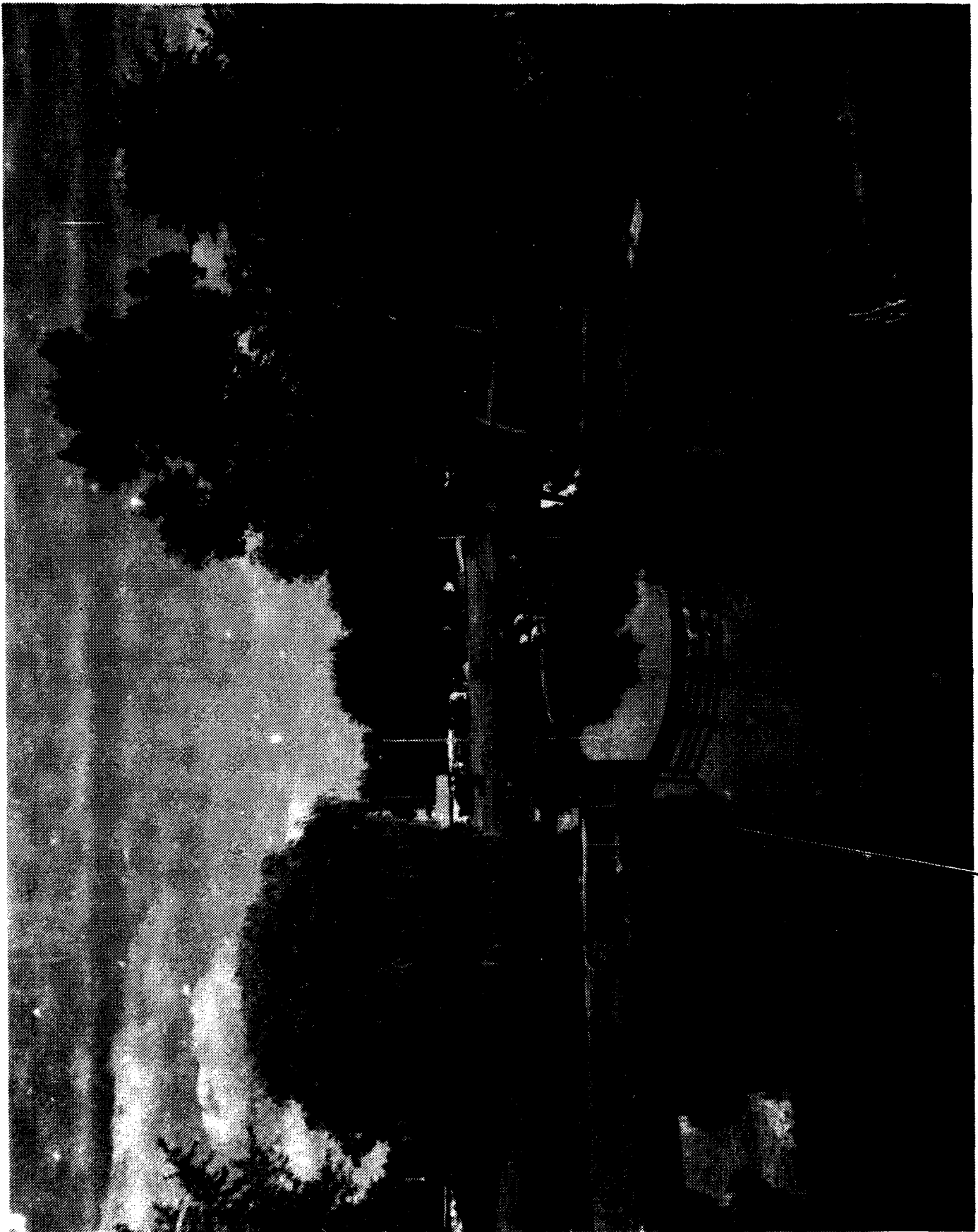
Education. - The level of education available and attained is a good indicator of the quality of life in the study area. Schools in the Portage area are part of a system of institutions which extend over approximately 220 square miles. Included in this system are 10 elementary schools, one junior high school, and one high school. The combined enrollment is almost 3,000 students with over 1,600, 600, and 600, respectively, in the three school levels. In addition to these schools, the Portage area educational system also offers vocational training at the high school in the evening. About 14 percent of the people in Columbia County have college degrees or some college education.

Recreation Resources. - Three major recreation and tourism areas are located wholly or partially within Columbia County. The Wisconsin Dells, a very popular tourist attraction, is approximately 17 miles northwest of Portage. Lake Wisconsin, 12 miles downstream from Portage, provides many recreation opportunities. Devils Lake State Park and several ski resorts are located west of the city along the Baraboo Range. The Range also has many State scientific areas.

Areas in the county available for recreation include nine wildlife management areas and two fish management areas (trout stream areas) administered by the State. The county administers seven county parks totaling approximately 100 acres. In 1975 there were 36 miles of designated bicycle trails and 54 miles of designated snowmobile trails.

The city of Portage has been active in providing for the recreation needs of its residents. Currently, the city has approximately 175 acres in 17 areas. The city has six parks on or near the Wisconsin River but no recreation areas on the Fox River. In fact, there is little public

recreation development along the Fox River in the vicinity of Portage.
The following figure is a picture of Pauquette Park, located in the south
central part of the city.



Pauquette Park, Portage, Wisconsin

Cultural Resources. - As early as the Middle Archaic Period (6000 - 3500 B.C.), people of the Portage area were living by hunting large and small game and by gathering plant food from the riverine and surrounding upland environments. During later cultural periods, the technologies for procuring food and other resources became more advanced and the populations of this and surrounding areas increased. By the Woodland Period (1000 B.C. - historic period), people were using ceramics for cooking and storage; corn, beans, and squash were supplementing the hunting and gathering economy; and burials were being placed in earthen mounds of various shapes.

Jean Nicolet may have seen the Portage area and its people in 1635 during his trip down the Fox River. From this point on, the Portage area became a focal point in the early history of the Northwest Territories and later of the State of Wisconsin. By the mid-1830's Fort Winnebago was connected by the Military Road to Fort Howard in Green Bay and Fort Crawford in Prairie du Chien. At this same time, an important aspect of Wisconsin's economy was the timber industry and wheat farming. By the late 19th century, Portage began developing an industrial base aimed at national marketing. Many of these early industries are still in operation today.

Transportation. - The roads in Columbia County form an important part of the highway network necessary to serve the people of Wisconsin and the Nation. The existing roads include several major Federal highways in addition to Interstate 90-94, State trunk highways, county roads and trunk highways, and town roads. Portage has the only publicly owned airport in the county. The airport is situated one-half mile northwest of the downtown area and is considered a part of the Wisconsin State Airport System Plan. A number of private airports scattered throughout the county are generally suitable for single engine aircraft. In Columbia County, two bus companies -- Marose Bus Service and Greyhound

Lines -- are licensed to carry passengers. Rail service is provided by the Chicago, Milwaukee, St. Paul, and Pacific Railroad and the Chicago and Northwestern Railway.

Water Supply and Water Quality

The Portage area relies exclusively on ground water for its water supply. Municipal wells obtain water from Cambrian sandstone aquifers. Although this is the main source of water, some private wells get water from sand and gravel aquifers. Generally, the ground water supply is abundant.

Portage city officials are constructing a new wastewater treatment plant to replace their old, hydraulically overloaded facility. The new treatment plant will discharge to the Wisconsin River at the downstream end of the city.

ANTICIPATED FUTURE RESOURCE BASE (FUTURE "WITHOUT" CONDITION)

Prediction of future conditions in the area requires careful analysis of the existing setting, the trends now developing, and the limitations of the resource base. When determining the effects of any proposed major Federal action, the predicted setting with the proposed project in place must be compared with the setting as it would be without the proposal. This "with and without project" assessment requires a reasonable estimate of future conditions. Additional information concerning the future "without" condition is presented as part of the no action alternative investigated in the plan formulation process (see Appendix A).

Floods are likely to continue in the county at their present frequency and magnitude. A large portion of the study area would remain under floodplain classification. Flood hazards would continue to threaten the health and well-being of over 1,000 people, potentially causing damage to property and interruption of basic services. All monetary and nonmonetary flood losses would continue on an increased scale. Changes

in the type and extent of flood damages would result from implementation of community development programs and from increases in content and inventory values.

Area and Portage community development and growth are expected to continue. New development located in the floodplain would be required to comply with the regular phase of the FEMA (Federal Emergency Management Agency) National Flood Insurance guidelines which are based on the 100-year flood area outline. Purchase of flood insurance would be a costly way of life for those people living within the floodplain areas. Most likely, only some of the Portage and Pacific residents would participate. Some floodproofing would be undertaken by individuals; however, this activity would be limited since this action is difficult and costly to implement on the kinds of structures that exist in the floodplain.

The existing levee system would remain in place but would be breached for any flood event (especially at the identified critical levee sections) and would be overtopped for certain flood events. Complete failure of the entire levee system is highly unlikely since these levees are owned and maintained by the State of Wisconsin. As a result, a proper without condition cannot ignore the levee system. However, haphazard construction, as-built designs, and construction materials used all combine to create a serious potential for breaching. Breaching would not result in complete levee failure as the remainder of the levee system would continue to be effective, with the majority of the flood flows being confined to the area riverward of the levee system. Regular maintenance is only a stopgap measure needed to partially reduce the breaching potential of the levees. The Portage Canal Lock gates would remain subject to potential failure in the event of a flood of any size. As a result, the existing flood forecast, warning, and temporary evacuation plan would continue to be in effect for the county. In general, this plan is complete and involves maintenance, surveillance, flood alert requirements, administrative details, etc. However, this plan would not eliminate the significant flood damage potential.

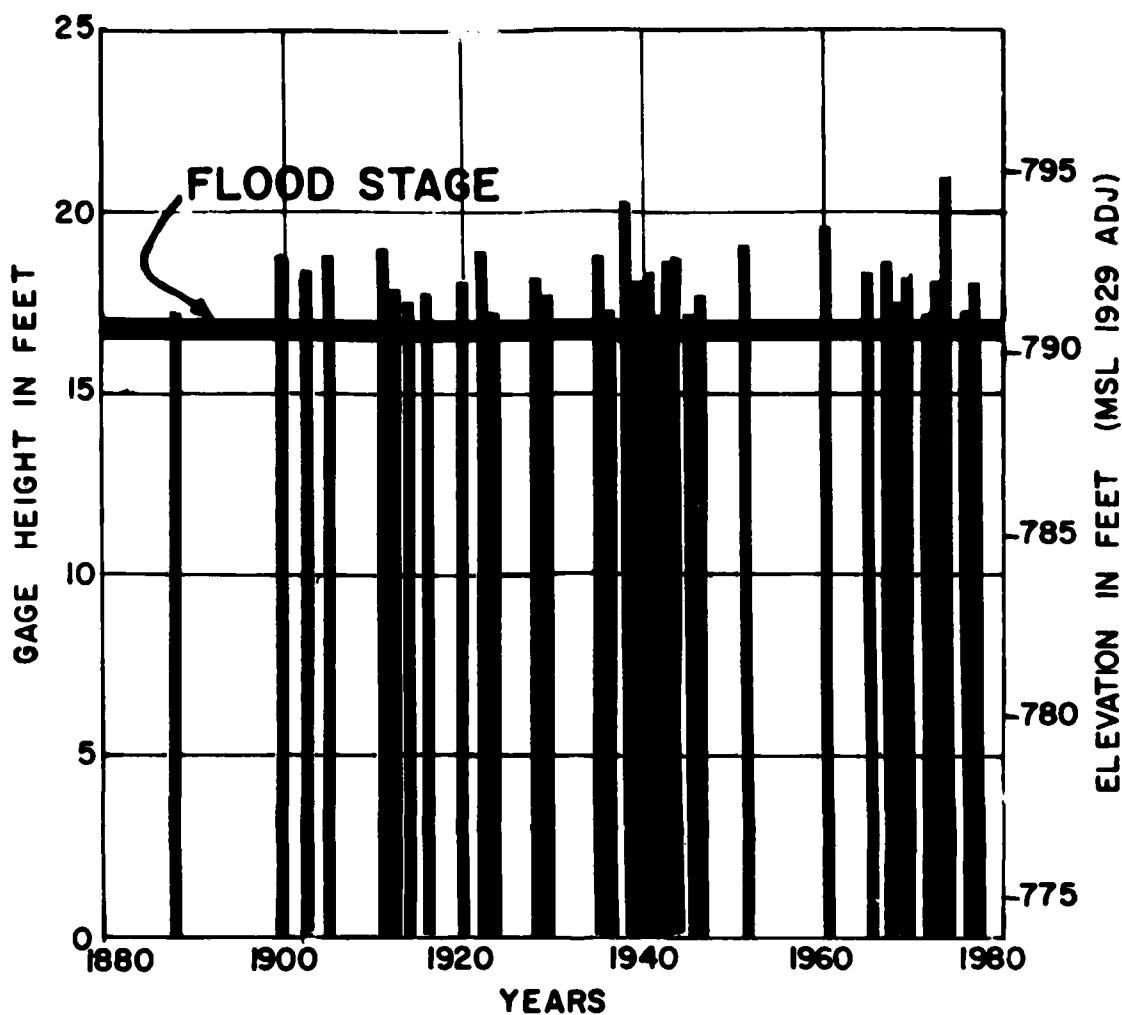
In general, the future environmental setting would not change significantly. However, recreational development may increase, should the Portage Canal be developed, creating additional recreational facilities. Population, education, employment, and the economic base of the area would remain stable with increases as previously discussed.

PROBLEMS, NEEDS, CONCERNS, AND OPPORTUNITIES

Of the potential types of water resource management and related problems, only flooding is of primary concern in the study area as expressed by the public. Although flood damages occur throughout the study area, the majority of existing flood damages are at Portage. Pursuing flood control actions has been a long-time effort of many of the residents of Columbia County. This is evidenced by the extensive flood control efforts that have occurred since the mid-1800's. Any of the other concerns, such as the Portage Canal which is a national historic landmark, the hydrologic and hydraulic base used for floodplain regulations and to establish flood insurance rates, and sponsorship of a flood control project, all relate closely to the flood problem and are covered in the formulation analysis and support information developed as part of this feasibility study.

Floods on the Wisconsin River result from rapid runoff following intense rainfall and from snowmelt runoff. Spring floods occur with about the same frequency as summer floods, generally lasting up to 8 days in the vicinity of Portage. The largest flood of record occurred in September 1938 and had a flow of 72,200 cfs (cubic feet per second). The Wisconsin State Register, Portage, Wisconsin, in its September 1938 edition, stated ". . .The water flowed rapidly northward toward the city. . . .The view . . . over Caledonia . . . resembled that in a lake country. Large areas of the township were underwater. . . ." It was noted that the 1938 flood story paralleled the story written about the 1911 flood. Other early floods included the 1838, 1845, 1850, 1852, 1880, 1900, 1905, 1922, and

1935 floods. Also, the 1938 flood was not the last to occur; high waters of significance were recorded in 1943, 1951, 1960, 1965, 1967, and 1973. The years for which river levels were above flood stage (17.0 feet or elevation 790.94 at the Portage Lock) are shown on the following figure.



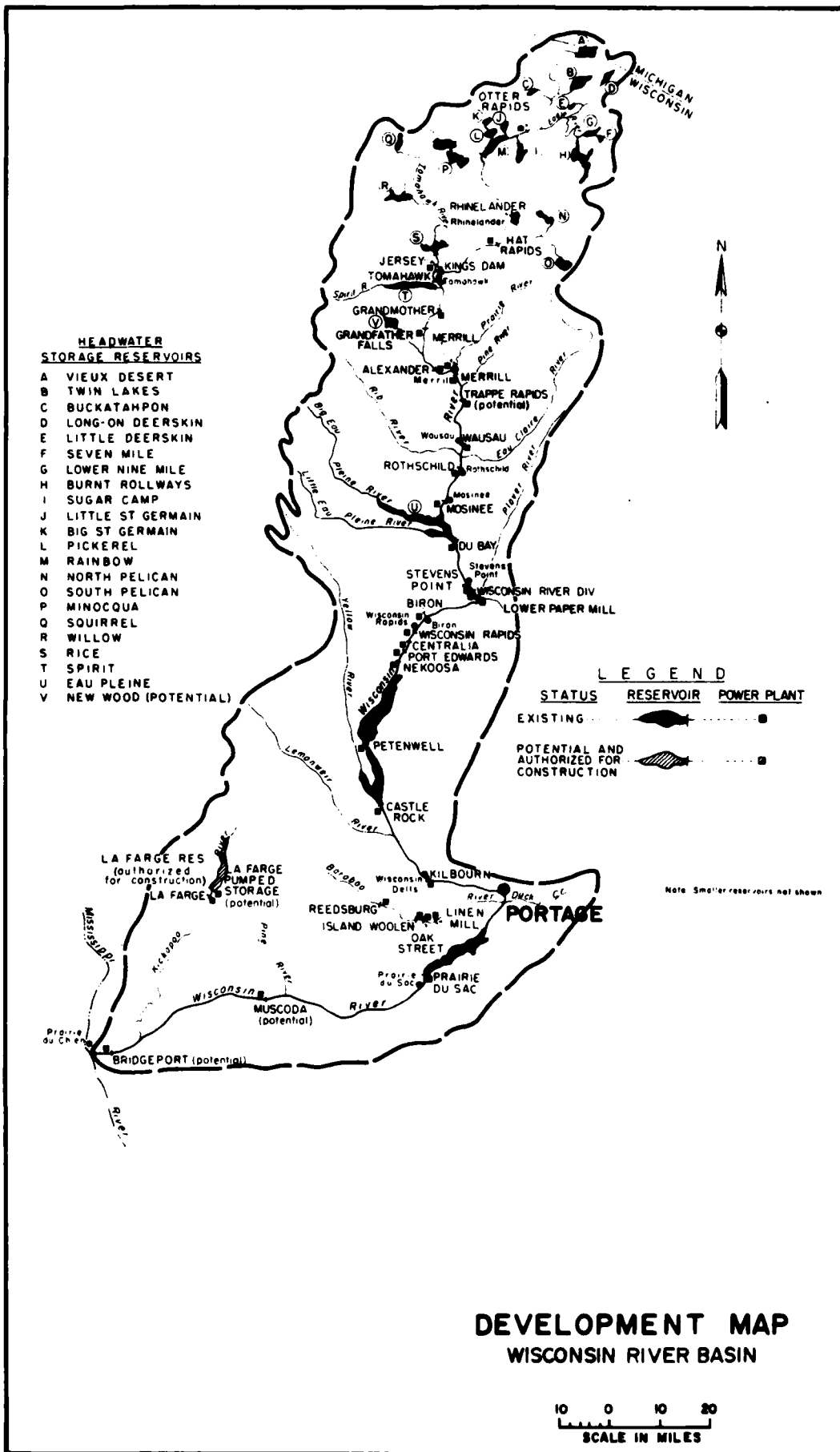
GAGE IS ON LOCKS IN
PORTAGE, WISCONSIN AT
MILE 115.0 ABOVE THE
MISSISSIPPI RIVER

STAGES ARE ADJUSTED
TO PRESENT GAGE ZERO
OF 773.94 FEET MSL
1929 ADJUSTMENT

FLAWS ABOVE FLOOD STAGE

WISCONSIN RIVER
PORTAGE, WISCONSIN

The Wisconsin River drainage basin has changed considerably since the days of pioneer settlement. Many upstream dams have been built and many levees have been constructed within the county since the mid-1800's (see History of Existing Water Projects). The following figure shows the general location of the storage reservoirs throughout the basin.



SOURCE: WATER RESOURCES APPRAISAL FOR HYDROELECTRIC LICENSING, F.P.C., 1969"

The 1938 flood came within inches of overtopping the existing levees in some places and breached or overtopped levees in other places. One 20-foot-wide gap in the Portage levee that year was repaired by placing a school bus in the breach -- the bus is still there. Since that disaster occurred, some of the levees were raised about 2 feet above the water surface elevation. Although the levees have served their purpose well for the past 30 or 40 years, at times it is necessary to undertake extensive efforts to keep the levees from breaching. Riprapping with large boulders has proved effective; often, however, this results in loose rock facing.

The condition of the existing levees requires scheduled and frequent attention by personnel from the Department of Natural Resources. As stated in a Department of Natural Resources document, "As soon as the ground thaws, it is necessary to patrol the levees to get rid of burrowing animals and to fill their holes. Later it is necessary to cut the brush and spray the weeds, mow the levees and perform the numerous other jobs necessary to keep the levees open for inspection and accessible for flood operations. In the fall it is again necessary to patrol the levees for burrowing animals until the ground is frozen solid, so there will be no holes to endanger the levees when the spring flood comes."

The document goes on to say that, "Floods which approach the top of the levees require constant watching day and night over the entire length of the levee. Because some reaches become inaccessible by automobile and there is no road at the top of the levees, men from Columbia County are used to help Division personnel patrol the levee on foot. These men are equipped by the county with walkie-talkies to provide communication."

None of the levees meet standards for permanent flood protection works. The existing levee system was built haphazardly over a 100-year period and was not designed to the best standards. Different portions were completed as money became available or when the river threatened to

breach a section. Geotechnical evaluations indicate that the existing levees are primarily susceptible to failure by sloughing of landside levee slopes or failure due to piping. The predominance of readily erodible levee and foundation materials identifies the potential for existing levee erosion from channel flows if the levees became overtopped or if the riverward erosion protection failed. Local interests have reported occurrences of sand boils during past floods. Only quick emergency action of placing additional pervious fill on the boil areas has been able to save the levee.

One more, equally important reason for the levees not being certified adequate for any degree of protection is the existing upper Wisconsin River Portage Lock gates. These gates provide a critical link in the existing levee system. Failure of the gates during any flood event would certainly cause inundation of the entire southeast side of Portage. Possibly little or no warning time would be given and damages would be catastrophic. The condition of both sets of gates at the upper Portage Lock is poor. The rusty fabric has many holes, and water flows freely through the gates even during normal or low flows on the Wisconsin River. As a consequence, the potential for failure of these gates during a flood event is great. The following figures show conditions of the levees and the Portage lock gates.



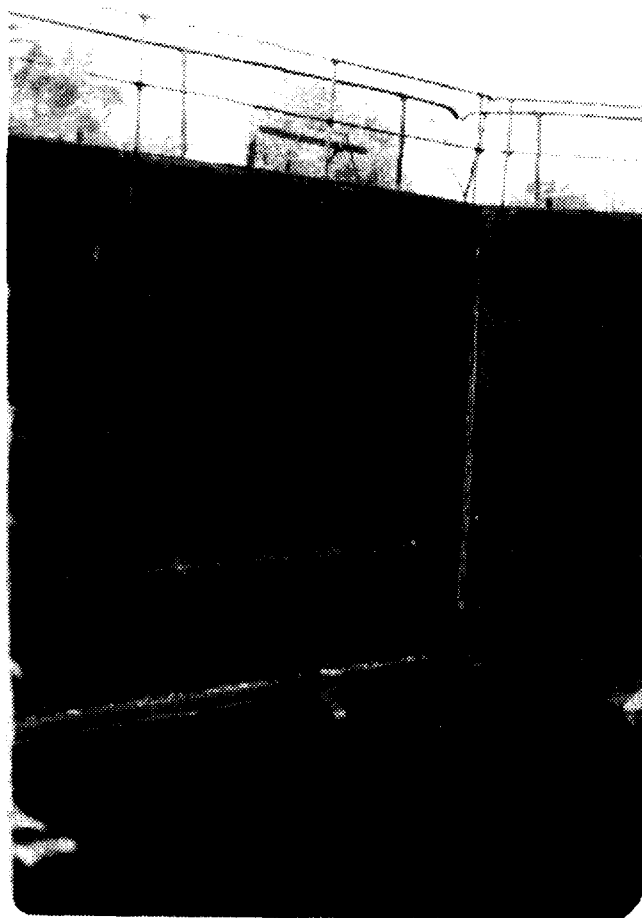
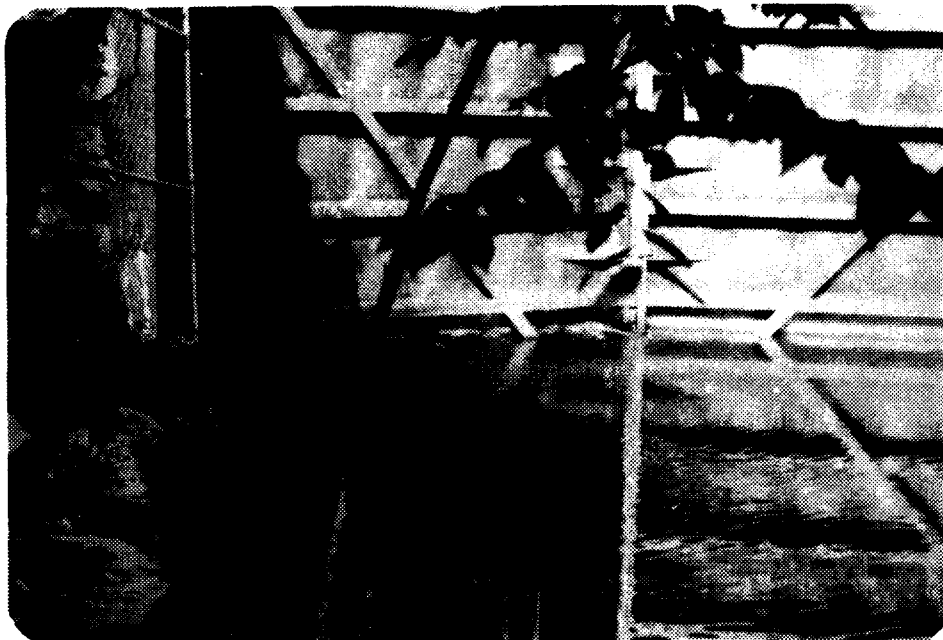
Steep side slopes on levee near Riverside Park.



Sand buildup in Portage Lock area through holes in the upper gate.



Critical section of the levee near Miami Street.



Holes in existing upper lock gates.

STUDY OBJECTIVES

The general planning principles and guidelines for conduct of a feasibility study such as this require that all federally assisted water resource projects be planned to further the national economic development (NED) objective. This must be accomplished consistent with protecting the Nation's environment. The specific study objectives must be derived from the study area problems and, in this case, the major problem is flooding. Therefore, consistent with the Federal requirements and the identified problems, the study objectives include:

a. Providing an acceptable flood control plan for Portage, Wisconsin, consistent with the historic and environmental importance of the area.

b. Developing a hydrologic and hydraulic analysis of existing floodplain conditions which will provide a basis for floodplain regulation and flood insurance.

The latter objective was fully accomplished, based on the detailed floodplain analysis completed for this document and additional work by the Federal Emergency Management Agency and the Wisconsin Department of Natural Resources. Local regulations have been updated and a new flood insurance study has been completed.

In addition to defining specific study objectives, the Wisconsin Department of Natural Resources and the local interests identified a number of actions that should be accomplished as part of the overall study effort. Most of these actions related very closely to the updated floodplain analysis and the alternatives under investigation in this study.

PLANNING CONSTRAINTS

Any flood damage reduction measure(s) or plan identified for all or part of the study area through the plan formulation process must be implementable. That is, the selected plan must be technically and economically feasible; socially, environmentally, and culturally acceptable; and capable of being carried out with a local sponsor.

In addition, the Executive Orders 11988 - Floodplain Management, and 11990 - Protection of Wetlands, and the Executive Memorandum on Prime and Unique Farmland should be considered as much as possible in the development of implementable plans.

IDENTIFICATION AND DEVELOPMENT OF ALTERNATIVE PLANS

The most urgent water resource need of the basin is reduction of flood damage. The flooding problems occur throughout the county but the principal urban damage center is Portage. No other critical water resource need was identified. Therefore, this study concentrates on all possible alternative plans to meet the flood damage reduction need of the study area. Twenty-two alternatives were initially identified in the August 1977 Plan of Study. Each alternative was then considered in detail in the stage 2 portion of the study. That information is summarized in the following paragraphs under each alternative heading.

ALTERNATIVES CONSIDERED

The alternatives considered in this study include the following:

- No Action
- Improvement to Portage Levees (including a ring levee)
- Improvement to Portage and Lewiston Levees
- Improvement to Caledonia Levees
- Improvement to All Levees

- Outlet in Caledonia Levee
- Channel Modifications (including clearing and dredging)
- Diversion Channel to Baraboo River
- Diversion Channel to Long Lake
- Diversion Channel to Big Slough
- Reservoirs (including increasing storage at existing reservoirs and new reservoirs)
- Nonstructural Measures (including closures, raising structures, small walls, rearranging property, evacuation, floodplain regulation, flood insurance, and flood forecasting)

BRIEF DESCRIPTION OF ALTERNATIVES

Alternatives are described below. A more detailed discussion of alternatives with general location maps is provided in Appendix A, Plan Formulation.

No Action

Flooding will continue throughout the study area as no new flood control measures will be implemented. Floodplain regulation and flood insurance will be a way of life. The Wisconsin Department of Natural Resources will also maintain the existing levee system and the Columbia County Office of Emergency Government comprehensive plan for levee maintenance, surveillance, and evacuation during high flows will remain in effect.

Improvement to Portage Levees

The existing levee located within and downstream of the city of Portage would be strengthened, raised, widened, and extended. Total length of improvements would be 3.2 miles. All floodprone areas of Portage would be protected. Interior drainage facilities would be provided where necessary.

Ring Levee for Portage

This alternative would consist of a ring levee around the southeast portion of Portage. The other floodprone areas of the city would be protected by other levees. Additional features include several road closures, two canal closures, acquisition of several residences, and interior drainage facilities.

Improvement of Portage and Lewiston Levees

In addition to the levees described in the improvement to the Portage levee alternative, a new 5.1-mile levee would be constructed in Lewiston Township near Highway 16 and the Chicago, Milwaukee, St. Paul, and Pacific Railroad. Total levee length including road raises would be 8.3 miles.

Improvement of the Caledonia Levee

This levee alternative would consist of upgrading the existing levee on the south bank of the Wisconsin River between the Pine Island Wildlife Area and the downstream end of Portage. Over 9 miles of levee would be improved.

Improvement of All Levees

This alternative would combine the upgrading and extension of the Portage, Lewiston, and Caledonia levees as described earlier. More than 17 miles of existing levees in Columbia County would be improved.

Caledonia Outlet

For this alternative, an opening would be made in the existing Caledonia levee to reduce flood stages in the Lewiston and Portage areas. The outlet would be located in the Pine Island Wildlife Area.

Channel Modification (Dredging)

An 11-mile reach of the Wisconsin River between the Pine Island Wildlife Area and the mouth of the Baraboo River would be dredged. All dredged material would be placed outside the floodplain.

Channel Modification (Clearing)

The same 11-mile reach of the Wisconsin River as identified in the dredging alternative would be extensively cleared of trees and brush. This clearing would involve both the channel and the overbank areas.

Channel Diversion to the Baraboo River

A channel to divert flood flows from the Wisconsin River would be built mostly in the Pine Island Wildlife Area. Two bridge modifications would be required for this 3-mile diversion.

Channel Diversion to Long Lake

A 4-mile channel would be used to divert flood flows from the Wisconsin River through Caledonia Township and back into the Wisconsin River via Long Lake. Bridge raises would be needed for State Highways 33 and 78.

Channel Diversion to Big Slough

This channel would divert flood flows from the Wisconsin River through Lewiston Township to Big Slough in the Fox River basin. Bridges would be needed for U.S. Highway 16, a railroad, and a county road. The total diversion length would be nearly 4 miles.

Increasing Flood Storage at Existing Dams

This alternative involves increasing the flood storage at existing dams by lower operating pools or modifying operations. Reservoirs considered included Castle Rock, Petenwell, Du Bay and Prairie du Sac.

New Reservoirs

Construction of new reservoirs was considered for the Wisconsin River main stem and the uncontrolled tributaries of Lemonweir, Yellow, Little Eau Pleine, and Pike Rivers.

Nonstructural Measures

Although nonstructural measures are a means to reduce flood damages, they do not try to confine a river within its banks or store or divert floodwaters. Rather, these measures emphasize removal of floodplain structures, flood proofing individual structures, or implementing policies to restrict new development in flood-prone areas. Measures considered include:

- Installing closures on openings in structures
- Raising existing structures in place
- Constructing small walls or levees around structures
- Rearranging or protecting damageable property within a structure
- Acquisition of structures
- Implementing floodplain regulations
- Providing flood insurance
- Implementing flood forecasting and warning systems and an evacuation plan

ASSESSMENT AND EVALUATION OF ALTERNATIVES

The purpose of this evaluation is to identify the alternatives that best satisfy the study objectives and are worthy of further consideration. The effectiveness, acceptability, completeness, and efficiency of each alternative were considered. Specific details are presented in the plan formulation appendix; however, the subsequent paragraphs briefly discuss the results of this evaluation used to identify those alternatives recommended for further study.

Of the levee alternatives, only improvement of the existing Portage levee system is cost effective because it provides more benefits than costs. This is because most of the flood damages within the study area occur within the city of Portage. The Lewiston and Caledonia levees are not economically feasible by themselves and therefore are not worthy of further recommendation. For the same reason, a total levee system for all three areas and a combination levee in Lewiston with improvement of the Portage levee alternative lacks the necessary incremental economic justification. However, there is one exception that warrants additional consideration. A flood flow analysis of the Wisconsin River indicates that floods in excess of the 500-year level will overflow into the upper Fox River basin and possibly influence flood stages on the Fox River in the southeast portion (Ward 1) of Portage. A combination levee in Lewiston with improvement of the Portage levee alternative could prevent this overflow to the Fox River and provide Portage with greater than a 500-year level of flood protection. From this aspect, additional study is warranted for this alternative. Similarly, a ring levee for the Ward 1 area of Portage would offer the higher degree of protection from both the Wisconsin and Fox Rivers. However, the economic feasibility is questionable. Also, the ring levee alternative would significantly affect the national historic landmarks in three locations and severely disrupt the social well-being of the city by requiring acquisition of

several residential structures. For these reasons, the ring levee alternative should be considered only as a variation to the Portage and Lewiston levee alternative.

An outlet in the Caledonia levee is not recommended for several reasons: damages from large floods would not be reduced, costs would be much greater than benefits, and the impacts on biological and social resources would be severe.

Channel modification by clearing or dredging is not recommended because the costs would substantially exceed the benefits, and the impacts on biological and possibly cultural resources would be severe. Likewise, channel diversions to the Baraboo River, Long Lake, or Big Slough are not recommended because the costs would be far greater than the benefits, and impacts on biological, cultural, social, and recreational resources would be severe.

Alternatives involving new reservoirs or increasing flood storage of the existing reservoir system need not be considered further since these alternatives would not protect Portage from large floods. Also, the costs would clearly outweigh the benefits, and there would be moderate to severe adverse impacts on biological, cultural, and social resources.

Except for acquisition, none of the nonstructural measures by themselves were considered to be a complete solution to the flood problems within the study area. However, a combination of nonstructural measures or nonstructural measures used in addition to a structural alternative was recommended for further study because of the potential to develop a more complete plan and the limited environmental and cultural impacts occurring from implementation of such nonstructural measures.

Generally, the physical and economic feasibility of protecting the floodplain area with nonstructural measures such as floodproofing (by structural raises, walls, or closures) and acquisition was considered

doubtful because of the high initial costs and the associated social dislocation impacts. However, because of the identified benefits in removing the problem from the floodplain, additional study may show otherwise. Of the remaining nonstructural measures, adoption of floodplain regulations, consistent application of a flood insurance program, and use of the sound flood warning and evacuation plan were considered appropriate for the study area with or without a recommended structural alternative.

The no action alternative maintains the status quo -- the Wisconsin Department of Natural Resources would continue to maintain the existing levees, and floodplain regulations and insurance would continue to be enforced and available. Although the existing situation is functioning, there are expressed problems such as inadequate protection, restriction on floodplain development, and lack of confidence in continued levee maintenance. The no action alternative, however, will continue to be used as a basis for further study recommendations.

In summary, the alternatives worthy of additional study are listed below.

1. Improvement of the Portage levee
2. Improvement of the Portage levee and construction of a new levee in Lewiston Township
3. Ring levee for Portage
4. Nonstructural measures for the floodplain area
5. No action

The following figure provides a visual summary of the portion of the formulation process completed so far.

Plan formulation process
(Summary of initial actions)

Potential problems	Identified problems	Alternatives considered	Alternatives recommended for further study
Flooding in Portage	Yes	No action Portage levee Ring levee Portage/Lewiston levee All levees Caledonia outlet Channel modifications Diversions Reservoirs Nonstructural	No action Portage levee Portage/Lewiston levee Ring levee for Portage Nonstructural
Flooding in the rest of the study area	Yes	No action Portage/Lewiston levee Caledonia levee All levees Caledonia outlet Channel modification Diversions Reservoirs Nonstructural	No action Portage/Lewiston levee Nonstructural
Other water resource problems	None	-----	-----
Basis for floodplain information reports		A detailed floodplain analysis was completed as part of this study and was used in conduct of a new flood insurance study for Columbia County prepared under the guidance of the Federal Emergency Management Agency.	

REFINEMENT OF ALTERNATIVES RECOMMENDED FOR FURTHER STUDY

The next action in a formulation analysis is to refine alternatives that have been recommended for further study. From this refinement and subsequent evaluations, an overall plan was selected. Besides updating the flood damage data and other base information used in critically evaluating the alternatives, this refinement considered the degree of flood damage reduction, the specifics of alternative features, the economic and environmental acceptability, and the overall alternative implementability.

The plan formulation appendix discusses each of these factors in detail as they relate to the individual alternatives. A general discussion of each refined alternative is presented in subsequent paragraphs.

No Action Alternative

This is the future anticipated condition without implementation of a flood control project. In general, the environmental setting, population, employment, education, and economic base would remain stable with increases as previously discussed. Since flooding would continue, a large portion of the study area would remain under floodplain classification. The existing levee system would continue to be maintained by the Wisconsin Department of Natural Resources. However, none of the levees including the lock area meet standards for permanent flood protection works and, consequently, breaches could occur which would continue to threaten the health and well-being of the people in the area.

The recently completed flood insurance study for Columbia County and the city of Portage has resulted in a conversion from the emergency phase to the regular phase of the National Flood Insurance Program. The purchase of flood insurance for properties in the floodprone area will be a costly

way of life. Therefore, it is expected that only some of the Portage and Pacific floodprone residents will participate. The remaining floodprone residents will have to live with the existing situation.

With this alternative, some changes in the type and extent of flood damages would result in the urban Portage area as structures are either removed from the floodplain or floodproofed under a home improvement effort or the Department of Housing and Urban Development's Block Grant Program for Community Development. However, given the historic importance of the area and the fact that few changes have occurred over time, it is unlikely that many structures would be affected. Also, floodproofing is difficult and costly to implement for the depth of flooding and the types of structures that exist in the floodplain area. In general, all monetary and nonmonetary flood losses are expected to increase because of anticipated community development and growth, and increases in content and inventory values of floodplain structures.

The existing flood forecast, warning, and temporary evacuation plan will remain in effect for the county. This plan discusses in detail the following:

- a. Routine levee maintenance.
- b. River stage surveillance and emergency actions including contact with upstream reservoir operating stations.
- c. Flood alert plan.
- d. Postflood alert details.
- e. Administrative details.

In general, this plan is complete and serves as an important aspect of any future flood control effort in the county. However, this plan does not eliminate the serious potential for significant flood damages and losses to occur.

Improvement to the Portage Levee

This alternative involves raising, widening, and modifying the existing levee system located within the city of Portage and the town of Pacific. Additional levees would be constructed in Portage near the Highway 33 bridge and upstream in the Summit Street area (Ward 8).

Main features of this alternative would include approximately 3 miles of levee, 0.2 mile of road raise, 550 feet of floodwall, acquisition of 2 residences, crossing of the Portage Lock and Canal, road ramps, a railroad stop log closure and a highway sandbag closure, an interior drainage pumping station, and necessary additional collection works for seepage and surface runoff. Recreation facilities and aesthetic treatment measures would be included and topsoil/seeding or riprap would be used to cover the entire levee. Plates 1 through 4 show the levee details, and appendix H provides a description of the proposed recreational facilities and aesthetic measures.

Four important considerations were analyzed in refinement of this alternative including: (1) crossing of the Portage Canal and Lock area, (2) the overall alignment, (3) the specific levee features, and (4) the degree of protection. Only a brief summary of these considerations is presented here while additional detail is provided in the plan formulation appendix.

For the Portage Canal and Lock area (a property listed on the National Register of Historic Places), two options were considered. One option included extending the Portage levee across the mouth of the canal. The second option included incorporating the Portage Canal Wisconsin River Lock into the alternative by relocating and raising the levee on the southeast side of the lock, replacing the existing upper (Wisconsin River) lock gates, and then using a floodwall on the northwest side of the lock to tie the project into high ground.

Costs were developed for each option. Although it would be less expensive to use the levee option, mitigation measures would be necessary to offset the visual and operational effects which would be out of character with the canal and its use and setting. Mitigation would be difficult and costly, therefore favoring the option which incorporates the lock into the levee. For this option, no mitigation would be necessary; however, cultural resource considerations would include aesthetic measures to maintain the historic character of the lock. These include appearance and salvaged materials as described in the EIS. Plate 2 provides an artist's conception of the best option and plate 3 provides a cross section of the Portage Canal improvement.

Different alignments for the Portage levee alternative were considered based on geotechnical design, avoidance of important environmental areas, avoidance of significant social impacts, cost, and social preference. The alignment which best fits these requirements is shown on plate 1 and described in detail in the plan formulation appendix. Because of the environmental consideration for the different alignments, the EIS discusses each as an alternative in order to provide a better understanding of the evaluations that were accomplished.

For this levee alternative, specific features which are important for proper functioning of the levee include levee design, seepage control, erosion protection, interior drainage, and closures. Based on geotechnical design, the levees and road raise at Portage would have a 10-foot top width, 1 on 3 riverward side slopes, and 1 on 5 landward side slopes. In addition, a berm would be required on the landward side of the levee downstream of Ontario Street. Three feet of freeboard above the design floodwater surface would be used and riprap protection is proposed where necessary. Drainage blocked by the levee/floodwall barriers and any excessive seepage would be controlled by appropriate interior drainage facilities. Typical sections for the levee are shown on plate 4.

Two degrees of flood protection were considered for this alternative -- 100- and 500-year. Because of the upstream Wisconsin River overflow problem to the Fox River, 500-year flood protection was considered the maximum, and standard project flood protection was not considered for this alternative.

Improvement of the Portage Levee and Construction of New Lewiston Levee

This alternative provides for standard project flood protection at Portage. It includes the same general alignment and all of the features discussed in the Portage levee alternative with two exceptions. First, the height and width of the Portage levee alternative would be increased in all areas to provide for the higher degree of flood damage reduction. Almost all of the specific features would be modified accordingly. The second exception requires that an additional 5.1 miles of levee be provided in the Lewiston area to prevent the Wisconsin River overflows into the Fox River upstream of Portage.

The most significant change in alternative features occurs at the Portage Canal Lock area. A major portion of the lock would need to be rebuilt by raising the lock walls and providing new upper gates. Although the reconstructed locks could be made to resemble the original lock or some other form that the lock had in the past, the visual impacts would be irreparable and extensive mitigation would be required. When providing the standard project flood level of protection, the option of placing a continuous levee across the mouth of the canal would be preferred because it would have less structural impact on the historic property. In addition, this option would be less costly because of the reduced, but still significant, mitigation measures.

Downstream of Ontario Street, two important changes would be required in developing a levee to provide standard project flood protection. The first involves an increase in the size of berm required on the landward

side of the levee while the second involves use of a closure instead of a ramp for crossing of the U.S. highway.

Upstream in the Lewiston area, a 5.1-mile new levee would be required to prevent Wisconsin River overflows into the Fox River basin. This levee would follow along the south side of the Chicago, Milwaukee, St. Paul, and Pacific Railroad.

The specific features for the Lewiston levee would be a 10-foot top width, 1 on 3 riverward side slopes and 1 on 5 landward side slopes, and 3 feet of freeboard above the design floodwater surface. Interior drainage would not be a problem, and topsoil/seeding would be used for all faces of the levee.

This alternative would protect almost the entire north bank of the Wisconsin River to a standard project flood level. No additional protection would be provided to the south bank and, in fact, there would be an increase in the flood potential for Caledonia Township. Flowage easements would be acquired from landowners on the south side of the river to compensate them for increased flooding induced by implementation of this alternative.

Ring Levee for Portage

This alternative was derived from a Fish and Wildlife Service recommendation and would consist of (1) a ring levee around the Ward 1 area located in the southeast portion of the city, (2) a levee in the Pauquette Park area, and (3) a road raise in the Summit Street area. The latter two components and that in the lock area would be similar to those described in the refinement to the Portage levee alternative. The alignment of the ring levee would begin upstream of the Portage Canal Lock and follow the existing Portage levee downstream to Ontario Street,

then proceed northeast to the Chicago, Milwaukee, St. Paul, and Pacific Railroad tracks and northwest to a point where the levee would tie into high ground on the west side of the canal.

Specific features of this alternative would be numerous road ramps and/or closures at all main road or railroad crossings. Two closures for the canal would be needed. Floodproofing for the few scattered dwellings east of the levee alignment, and acquisition/evacuation of most of the trailer park would be required. Geotechnical designs would be similar to those for the other structural alternatives, with levee top widths of 10 feet and side slopes of 1 on 3 riverward and 1 on 5 landward. Berms would be needed for all areas away from the river and a pumping station would be used to handle blocked drainage. Riprap would be used only on the part of the levee next to the Wisconsin River, while topsoil and seeding would be used elsewhere.

This alternative is being considered instead of developing the upstream Lewiston levee. Therefore, the degree of protection will be limited to standard project flood protection.

Nonstructural Alternatives

Four nonstructural alternatives were recommended for further study including: acquisition of the structures in the floodplain; floodplain regulations; flood insurance; and flood forecasting, warning, and evacuation. Only acquisition of structures in the floodplain will be discussed here since floodplain regulations, insurance, and warning systems have already been discussed in the no action alternative.

Under this alternative all of the residential structures and businesses in the floodprone areas of Portage and in the Blackhawk Park area of Caledonia Township would be acquired. This acquisition would occur based on the desires of individual property owners. Using the present rate of people moving into and out of the floodplain, the entire plan would not

be completed for many years. In addition to acquisition, structures around Summit Street and Pauquette Park would be floodproofed. No consideration was given to acquiring or uniformly floodproofing the remaining residential/business structures in the Columbia County floodplain, since many are seasonally inhabited and are scattered throughout the area.

The acquisition would require purchase of the residential and business structures partially occupying approximately 42 city blocks within Portage and several sections in Caledonia Township. Sufficient residential land in the city and county would have to be made available, with and without existing dwellings, to accommodate all evacuated persons who wished to relocate there. It would be the responsibility of the city/county to insure that sufficient improved lots for new or relocated dwellings were ready by the time of project implementation to meet the demand for them. Before acquisition took place, the availability of replacement dwellings for all displaced residents would have to be assured.

There would be no change in the floodplain management ordinance and, therefore, any possible changes in floodplain regulation would be independent of project implementation. All property owners with property remaining in the floodplain subject to floodplain regulation could, at their option, obtain technical assistance in flood proofing their structures. This assistance would help them to determine which measures are best suited to their structures.

All persons who would be displaced from their business locations, homes, and/or homesites as a result of implementation of this alternative would receive the benefits provided for in the applicable Federal and State laws in addition to the purchase price of any property which would be acquired. The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646), which applies to all land purchases for federally assisted projects, would be followed.

Public Law 91-646 requires that all persons displaced by land acquisition actions of a federally assisted program be fully advised of the benefits available to them to minimize any adverse impacts. In general, the law seeks to provide displaced residents with housing at least equal to that which was vacated. Persons living in substandard housing who are displaced would be assisted in moving into other housing which meets minimum standards with respect to decency, safety, and sanitation. This type of benefit is entirely separate from, and in addition to, the price paid for the property acquired. Some additional requirements to these are included in Wisconsin's relocation law and would be the responsibility of the local sponsor.

Land use controls consistent with Wisconsin, city, and county floodplain management objectives would prevent unwise development from recurring in the evacuated area.

SELECTING A PLAN

A plan can be identified recognizing the economic, environmental, and implementability aspects of the refined alternatives. An alternative or combination of alternatives that best satisfies these requirements can therefore be included as part of an overall plan. For the study area this is consistent with the study objective described earlier. Further evaluation of the refined alternatives based on these three criteria is presented in the following figure and discussed in the following paragraphs.

Evaluation of the refined alternatives					
Item	Refined alternatives				
	No action	Portage levee ⁽¹⁾	Portage/Lewiston levee	Ring levee for Portage	Nonstructural (evacuation)
Economics (in \$1,000)					
First costs	-	7,238	11,765 ⁽³⁾	13,000	15,622
Average annual costs (2)	-	655	1,064	1,209	1,270
Average annual benefits	-	938	972	972	746
Net benefits	-	+283	- 92	-237	-524
Benefit-cost ratio	-	1.4	0.91	0.8	0.59
Environmental	No change	Little or no negative net change from existing conditions	Little to moderate negative net change from existing conditions	Little or no negative net change from existing conditions	Little or no positive net change from existing conditions
Implementability	-	Yes	No	No	No

(1) Developed to provide Portage with 500-year flood protection.

(2) Includes interest and amortization for 100-year life at 8-1/8-percent interest rate and additional charges for operation and maintenance.

(3) No flowage easements were included in the first costs.

Of the refined alternatives, improvement to the Portage levee developed to a 500-year level of flood protection is the most cost effective solution from a national perspective. The same alternative with 1-percent chance flood protection also provides a positive contribution to national economic development but to a much lesser extent (details of this alternative are presented in the plan formulation appendix). Continuation of the flood insurance, floodplain regulation, and flood warning programs does not contribute positively to national economic development although the study area is better off with the programs than without them. This is because these programs restrict future development in the floodplain and provide economic reimbursements to affected property owners for losses sustained from flooding. Also, the flood

warning/evacuation plan should help to minimize loss of human life due to flooding. Although evacuation of the floodplain eliminates the problem, it does not satisfy the national economic development objective.

Environmentally, any of the refined alternatives could be developed consistent with protecting the historic and environmental importance of the study area. None of the alternatives, if implemented with mitigation when needed, would cause significant adverse impacts on the existing environment.

Implementability depends on a number of factors, many of which were used in the overall formulation analysis to identify, screen, and refine the alternatives. The final test for implementing a plan is based on the support provided by local interests. The only alternative which meets this test is the Portage levee alternative. Support for this alternative is provided by letter dated 30 September 1983. A copy of the letter is provided in Attachment 1 of this document with additional discussion included in appendix J.

SELECTED PLAN

Based on the economics, environmental, and implementability aspects of the refined alternatives, a selected plan was chosen. The following figure is a summary of those actions. As shown, the selected plan consists of implementation of a 500-year flood control levee at Portage with modifications to the existing alignment and careful incorporation of the historic Portage Canal Lock into the levee plan. For the remainder of the floodprone study areas, the plan would include participation in the existing floodplain regulation and flood insurance programs. The selected plan is the NED plan.

Plan formulation process

Refinement of alternatives recommended for further study				Economic feasibility	Environmental acceptability	Implementability	(5) Selected plan
Lock area	Alignment	Degree of protection					
Levee across channel		100-year		Yes (1)	Yes	No	
Incorporating lock with levee	Existing	500-year		Yes (1)	Yes (4)	Yes	Modified Portage levee with 500-year degree flood protection and lock incorporated into levee.
	Modified	100-year		Yes (1)			
Levee across channel	Existing	500-year		Yes	Yes	Yes	
Incorporating lock with levee	Modified	SPF		No (2)	Yes (4)	No (3)	
Levee across channel	Existing or Modified	SPF		No	Yes (4)	No	
Incorporating lock with levee				No			
					Yes	Yes	Floodplain regulation and flood insurance for Columbia County.
Levee across lock	Existing						
Restructuring lock	Modified	SPF		No (2)	Yes (4)	No (3)	
				No			

(1) This alternative is economically justified but does not provide for the greatest economic net benefits.

(2) This alternative is not economically justified.

(3) This alternative lacks implementability because of economic justification, major adjustments in the Portage Canal area, and increased flood damages in Caledonia Township.

(4) Would require fish and wildlife mitigation.

(5) Since there is only one alternative in each area worthy of being identified as the selected plan, an additional discussion of tradeoffs and evaluation is not needed to complete the formulation process.

CULTURAL RESOURCE CONSIDERATIONS OF THE SELECTED PLAN

Cultural resource considerations of the selected plan would involve designs that will ensure the structural and historical integrity of the Portage Canal Lock and Zona Gale House. At present, this includes aesthetic features such as tinting and streaking of the concrete to make the lock gates appear historic, and landscaping.

In accordance with the regulation of the Advisory Council on Historic Preservation (36 CFR Part 800) a Memorandum of Agreement has been prepared for these National Register of Historic Places properties. This Memorandum is to be carried out during subsequent planning, engineering, design, and construction efforts. The Memorandum of Agreement will be implemented in cooperation with the Wisconsin State Historic Preservation Officer and the Advisory Council on Historic Preservation (for a copy of the Memorandum of Agreement, see Attachment 1 or appendix G).

HYDRAULICS OF THE SELECTED PLAN

Portage is a very hydraulically complex area. The existing 19-mile long levee system contributes to this complexity, and the condition and adequacy of these levees are important in project designs. Because the existing levees were constructed over a period of time using inadequate design standards, haphazard construction techniques, and erodible construction materials, there is a potential for failing, breaching, or overtopping of all, part, or none of that system during any particular flood event. Consideration was given to each of these conditions in developing the hydraulics of the selected plan. The following paragraphs briefly summarize the hydraulic information and assumptions at one index station (cross section AI located near the Portage Canal Lock) used for the flood insurance study, the economic base condition, the design water surface profiles, and the evaluation of project impacts. Additional hydraulic supporting information is provided in appendix C.

FLOOD INSURANCE STUDY

The adopted water surface profiles for the flood insurance study are for the total levee failure condition which corresponds to levee condition 3. Water surface elevations for that condition at cross section AI on the Wisconsin River are as follows:

<u>Condition</u>	Water surface elevation (feet) (National Geodetic Vertical Datum of 1929)	
	1-percent chance	0.2-percent chance
	<u>flood event</u>	<u>flood event</u>
Levee condition 3	791.6	792.0

ECONOMIC BASE CONSIDERATIONS

The economic base approach as discussed in the Economics Appendix considers a water surface profile without the existing levee in place. This corresponds to an assumed levee condition 3 (no levees) as identified in the Hydraulics Appendix. Using this as a base condition allows for significant levee failing and eliminates the potential for overestimating flood damages and corresponding benefits as a result of the present condition river stages created by the existing levee system. (A break-even analysis is included in the Economics Appendix. This includes damages from water surface profiles with the existing levee system in place.) Water surface elevations for the economic base condition at cross section AI on the Wisconsin River are as follows:

<u>Condition</u>	Water surface elevation (feet) (National Geodetic Vertical Datum of 1929)		
	1-percent chance	0.2-percent chance	Standard project
	<u>flood event</u>	<u>flood event</u>	<u>flood event</u>
Levee condition 3	791.6	792.0	792.4

DESIGN CONSIDERATIONS

For the selected plan, the existing Portage levee from the Portage Canal Lock downstream to Ontario Street would be strengthened, widened, and extended. Downstream of Ontario Street, the existing Portage levee would be realigned. For this plan, the water surface profile corresponding to a 0.2-percent chance flood selected level of protection was developed. Because there are four possible modes of levee failure, four profiles were developed to see which condition produced the highest elevation at a particular reach of the Wisconsin River. For a detailed discussion on the design water surface profile, refer to the Hydraulics Appendix, page C-50. The water surface elevation at cross section AI on the Wisconsin River is given below for the 0.2-percent chance flood event. Elevations for the 1-percent chance flood event and the standard project flood event are also given for reference.

Water surface elevation (feet)		
(National Geodetic Vertical Datum of 1929)		
<u>1-percent chance</u>	<u>0.2-percent chance</u>	<u>Standard project</u>
<u>flood event</u>	<u>flood event</u>	<u>flood event</u>
795.4	795.7	795.8

EVALUATION OF PROJECT IMPACT

In identifying project impacts, the with and without project condition must be analyzed. For both conditions, complete failure, breaching, and overtopping of the existing levee system were considered. For the without project condition, complete failure of the entire levee system is highly unlikely since these levees are not categorized as emergency levees but instead are owned and maintained by the State of Wisconsin. As a result, a proper without project condition could not ignore the levee system in the evaluation of project impacts. Most likely, breaching and/or overtopping would occur. Breaching of the existing

levee system is likely because of the highly erodible soils used in the levees. Breaching also would not result in complete levee failure as the remainder of the levee system would continue to be effective, with the majority of the flood flows being confined to the area riverward of the levee system. That is, the existing levee system would still have a hydraulic impact on water surface elevations.

Various levee conditions considered are described in the Hydraulics Appendix. For the without project condition, levee condition 2 modified was identified. This condition best represents how the existing levees would have a hydraulic impact even though the levees are breached. This without project condition assumes the following:

- a. The Caledonia, Lewiston, and Portage levees remain in place but would be breached and/or overtopped.

- b. Breaching would not result in complete levee failure so that the levee system would have a hydraulic impact on water surface elevations.

The without project condition is consistent with the determination made by the Wisconsin Department of Natural Resources that the established floodway exists riverward of the present levee system. Likewise, because of critical levee sections subject to failure, the Department of Natural Resources identified the floodplain as incorporating areas landward of the levee system.

Levee condition 2 modified best represents the with project condition (with the Portage levees raised). The with project condition assumes the following:

- a. The Portage levees are raised.

- b. The Caledonia and Lewiston levees remain in place but would be breached and/or overtopped.

c. Breaching would not result in complete levee failure so that the levee system would have a hydraulic impact on water surface elevations.

The with project floodplain is shown on plate 6. Information concerning discharges and frequency is presented in the Impact of Alternatives on Discharges and Frequency Section of the Hydrology Appendix. Specific information on stage and frequency relationships is found in the Selected Plan Section of the Hydraulics Appendix.

The with and without project conditions water surface elevations and discharges for the Wisconsin River at cross section AI on the Wisconsin River are shown in the following table.

Comparison of with and without project conditions					
Condition	Water surface elevation (feet) (National Geodetic Vertical Datum of 1929)			Discharge into the Fox River reservoir (cfs)	
	1-percent chance flood event	0.2-percent chance flood event	Standard project flood event	1-percent chance flood event	Standard project flood event
	1-percent chance flood event	0.2-percent chance flood event	Standard project flood event	1-percent chance flood event	Standard project flood event
Without					
project	795.4	795.7	795.8	200	500
With					
project	795.4	795.7	795.8	0	0

Given the present without project condition, no measurable hydraulic or hydrologic effects would occur to the river stages or discharges, respectively, as a result of the selected plan. The floodway and the floodplain outside of the protected area would remain as is with no increase in the Wisconsin River water surface profiles. Note that the proposed project levees are either at or slightly landward of the

existing levees so that the channel conveyance is not affected so as to cause measurable differences in water surface elevations. Note also in the above table, that the discharge into the Fox River swamp from the Wisconsin River is very small so that if the Portage levees are raised and strengthened, the additional discharge added to the Wisconsin River would not result in measurable stage increases.

SUMMARY OF SELECTED PLAN

Plan name	- Improvement to the Portage levee
Plan components	<ul style="list-style-type: none"> - 3.0 miles of earthen levee of which 0.4 mile is in the Pauquette Park area and 2.6 miles is from the Portage Canal Lock to County Road G. - 0.2 mile of road raise in the Summit Street area. - 550 feet of floodwall upstream of the Portage Canal Lock. - Acquisition of 2 residences of which one is in the Summit Street area and one is near County Road G. - Road ramps on Carroll and River Streets and on U.S. Highway 51. - New upper gates and improvements to the Portage Canal Lock. - One railroad stop log closure near County Road G. - One sandbag closure on U.S. Highway 51. - One interior drainage pumping station and additional collection works. - Recreation facilities near the Portage Canal Lock. - Aesthetic treatment measures. - Continuation of floodplain regulation and flood insurance for the remainder of Columbia County.
Recreation features	- A paved bicycle/pedestrian trail along the top of the levee between the Portage Canal and the downstream terminus of the plan.

- An interpretive/information display at the Portage Canal.
- An expanded Riverside Park area.
- Relocation and reorganization of facilities at Pauquette Park.
- Redevelopment of the boat launching area near Summit and Carroll Streets.

Design
and
construction
considerations

- Levee design - 10-foot top width, 1 V on 3 H riverward side slope, 1 V on 5 H landward side slope, 3 feet of freeboard.
- Seepage berm on landward side of levee downstream of Ontario Street.
- Riprap where needed and topsoil and seeding elsewhere.
- 500-year flood protection.
- New gates and structural modifications to Portage Canal Lock.
- Additional uplift considerations for floodwall and levee near Portage Canal Lock area.
- Interior drainage facilities to take care of seepage and surface runoff.
- Source of material is expected to be sand from the Wisconsin River channel.

Operation
and
maintenance
considerations

- Levee and floodwall maintenance.
- Pumping plant operation.
- Replacement of pumps.

Plan
accomplish-
ments

- 500-year flood protection for Portage, Wisconsin, and for the town of Pacific.
 - No increases in flood stages in other areas of the county.
 - Preservation of the historic and environmental importance of the area.
 - Development of hydrologic and hydraulic analysis of existing floodplain conditions.
-

Summary of
economic,
environmental,
and other
social effects

- Economic

Selected plan cost estimate

Levees and floodwalls	4,864,000
Drainage facilities	450,000
Landscaping and aesthetics	8,000
Recreation facilities	239,000
Real estate	590,000
Relocations	39,000
Engineering and design	798,000
Supervision and administration	250,000
Total first cost	7,238,000

Cost sharing (\$1,000's)
Traditional (1) Army's (2)

Project costs		
Federal	\$6,537	\$5,160
Non-Federal	1,401	2,778
Total	7,938	7,938
Average annual costs	655	655
Average annual benefits	938	938
Net benefits	+283	+283
Benefit-cost ratio	1.4	1.4

- (1) Based on 1936 Flood Control Act which requires non-Federal interests to provide all lands, easements, and rights-of-way; all alterations to utilities, roads, etc; and operation and maintenance.
- (2) Based on 65 percent Federal and 35 percent non-Federal.

- Environmental

- (1) Approximately 41.2 acres of floodplain forest, 11 acres of emergent wetland, and 11 acres of a shallow backwater environ (riverine) would be adversely affected.
- (2) Small mammals, songbirds, waterfowl, reptiles, and amphibians would also be impacted from the loss of the floodplain forest and emergent wetland areas.
- (3) Compensation (i.e., land acquisition) would not be needed due to protection of 29 acres of emergent wetland and 185 acres of floodplain forest lying riverward of the new levee between

Ontario Street and County Road G. Also, levees should be seeded with grasses and no mowing should be done until August of each year.

- (4) Could possibly add to the 29-acre emergent wetland. Excavate property and seed with emergent grasses.

- Social

- (1) Benefit social well-being by reducing adverse impacts that accompany flooding.
 - (2) Increased local cost in the short term.
 - (3) Employment will be enhanced.
-

COMPLIANCE WITH EXECUTIVE ORDERS

An assessment was made of the compliance of the selected plan with Executive Order 11988, Floodplain Management; Executive Order 11990, Protection of Wetlands; and Executive Memorandum, Prime and Unique Farmlands.

EXECUTIVE ORDER 11988, FLOODPLAIN MANAGEMENT, 24 MAY 1977

The objective of Executive Order 11988 is to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of the base floodplain and to avoid direct and indirect support of development in the floodplain wherever there is a practicable alternative. In accordance with Corps regulation 1165-2-26, the Corps is required to:

- o Avoid development in the base floodplain unless it is the only practical alternative.
- o Reduce the hazard and risk associated with floods.
- o Minimize the impact of floods on human safety, health, and welfare.
- o Restore and preserve the natural and beneficial values of the base floodplain.

Discussion of those points follows:

No development is expected to be induced from the selected project. No change in the water surface profile is expected because of the selected project condition. The selected project protects three reach areas as discussed in the social and economic analysis appendix. Reaches 1 and 2 are not expected to increase development in the future, with or without the project. Reach 2 is completely developed and reach 1 is developed except for wetland areas that will not be utilized in the future. Reach 3 is now completely developed except for wetland areas. A Department of Housing and Urban Development block grant program is taking place in this area; however, the selected project would not affect or be affected by this development. An area downstream of reach 3 is one area considered for development in the future as an industrial holding area. It is too low to be considered for structural development with or without the project.

The selected plan is the only feasible plan except for the same alternative with 100-year protection. The other major alternatives considered were improvements to the Portage/Lewiston levee and a ring levee around Ward 1. Both alternatives would provide protection from Fox River overflows. Only the former alternative would protect the future industrial holding area. However, the benefit-cost ratio for both alternatives is less than unity.

both hazard and risk, and the impact on safety, health, and welfare would be reduced by the project. The existing levee would be improved by the project levee built to the 500-year level with 3 feet of freeboard.

The project is not expected to seriously affect the natural and beneficial resources in the area. No changes in development are expected to take place from the project.

EXECUTIVE ORDER 11990, PROTECTION OF WETLANDS, 24 MAY 1977

The proposed flood protection plan for the city of Portage, Wisconsin, has been reviewed for compliance with Executive Order 11990, Protection of Wetlands. On the basis of this review and for the following reasons, it has been determined that no other practicable alternative exists and, therefore, the proposed plan would comply with the requirements of this executive order.

The areas of concern include a shallow backwater area of the Wisconsin River, floodplain forest, and emergent wetland. The shallow backwater area maintains a shifting sand substrate, subject to extreme water level fluctuations. During low flow periods, this area contains numerous exposed sandbars devoid of vegetation. Benthic invertebrates are present; however, they are not abundant or highly diversified. The fishery value is also relatively low because of insufficient food sources and lack of cover and spawning areas.

The floodplain forest and emergent wetland areas of concern are situated along the Wisconsin River at the downriver end of the project. The floodplain forest covers approximately 187 acres both landward and riverward of the existing levee. This floodplain forest is dominated by elm, cottonwood, maple, river birch, and ash and appears to be a typical climax bottomland hardwood wetland. Interspersed in this bottomland area, primarily on the landward side of the levee, are occasional small pockets of open water and emergent wetlands. The emergent wetland areas

cover approximately 40 acres and are entirely landward of the existing levee. This wetland consists of a mixture of vegetation, with sedges and cattails dominating, and a few open water areas. The major source of water for this wetland appears to be from precipitation since it is entirely cut off from other wetlands and the Wisconsin River by U.S. Highway 51 and 16 and the existing levee, respectively. Also, a cursory soil survey indicates that an impermeable layer exists in the soils at this site. The wetland does not have any fishery value; however, it appears to be quite productive, with benthic invertebrates, numerous small mammals, reptiles, amphibians, and birds being the major inhabitants.

Of the alternatives studied in detail, only the nonstructural plans would not impact any of the wetlands in the Portage area. Because this plan was found to be not economically feasible and would have adverse social implications, it was not considered to be a viable alternative.

The remaining Portage levee alternatives would have varying degrees of impact on the wetland areas in Portage. Each alternative would affect the 11 acres of shallow backwater wetland along the Wisconsin River. This was due to the relatively close relationship between both residential and commercial structures with the Wisconsin River. Renovation of existing levees that would provide an adequate degree of flood protection for the city would therefore need to be moved riverward of their current alignment. The ring levee around Ward 1 would further affect 4.6 acres of floodplain forested wetland adjacent to Ontario Street. This alternative would not be economically feasible and it would require the acquisition of several residential structures and a second crossing of the Portage Canal which is listed as a State historical place. Hence, the economic, social, and cultural implications of this alternative rendered it unacceptable.

The Portage levee with upgraded Lewiston levee alternative would impact the same floodplain forest and wetland areas as the Portage levee

alignments. In addition, this alternative would provide standard project flood protection for the city of Portage. However, because of economics, the adverse cultural impacts, and the social unacceptability, this alternative was not recommended.

The remaining Portage levee alternatives would consist of two alignments downriver from Ontario Street. One would follow the existing levee while the other would parallel U.S. Highway 51 and 16. Raising and widening the existing levee would require most, if not all, of the floodplain forested area between the levee and the Wisconsin River. In addition, it would essentially remove the floodplain forest and emergent wetland area landward of the levee from future flooding. Since industrial development appears to be moving into this area, it is possible that these two wetlands could be lost at some future time. Relocating the existing levee landward would provide protection for approximately 60 percent of the wetland area landward of the existing levee and all of the area riverward. For this reason and that of economics, this alignment for the Portage levee alternative is being recommended for construction. Therefore, the District Engineer has determined that the recommended alignment is in complete compliance with Executive Order 11990 and is the only practicable alternative for providing flood protection to the city of Portage, Wisconsin.

EXECUTIVE MEMORANDUM, PRIME AND UNIQUE FARMLAND

None of the area within the Portage city limits or within the project limits of the selected plan is designated as prime farmland. Therefore, no adverse effects on prime and unique farmland would occur with development of the selected plan.

PLAN IMPLEMENTATION

PROCEDURE

The steps necessary to bring the selected plan of improvement for flood control at Portage, Wisconsin, to reality are summarized as follows:

- o The final report will be reviewed by the Corps of Engineers higher authorities of North Central Division, the Board of Engineers for Rivers and Harbors, and the Office of the Chief of Engineers.
- o The Chief of Engineers will seek formal review and comment by the Governor of Wisconsin and interested Federal agencies.
- o Upon approval by the Chief of Engineers, the report is transmitted through the Secretary of the Army to the Congress for final review, authorization, and appropriation of needed funding.
- o Additional detailed studies are conducted, once funds are appropriated.
- o Formal assurances of local cooperation are requested from the official project sponsor.
- o Plans and specifications are prepared and a construction contract is awarded.
- o The project would be completed in two construction seasons.
- o Local interests assume project operation and maintenance responsibilities.

INSTITUTIONAL REQUIREMENTS

An analysis was made to determine the institutional requirements imposed by various alternative plans (including the selected plan) and the capability of existing institutions to meet those requirements. A summary of the institutional analysis is provided in appendix J. More detailed information is contained in the Wisconsin River at Portage, Wisconsin, Institutional Analysis dated August 1984.

DIVISION OF PLAN RESPONSIBILITIES

Under the traditional requirements of local cooperation and for the plan components to serve their intended purposes, local interests must agree to certain conditions of local cooperation. If a change in cost-sharing policies is adopted that would go toward a uniform percentage of non-Federal sharing of the construction costs, all of the items provided by non-Federal interests would be credited toward their share. Before construction, local interests would have to furnish assurances satisfactory to the Secretary of the Army that they will:

a. Provide without cost to the United States all lands, easements, and rights-of-way, including suitable borrow and dredged and excavated material disposal areas, as determined by the Chief of Engineers to be necessary for construction and maintenance of the project.

b. Hold and save the United States free from damages due to the construction and maintenance of the project, except for damages due to the fault or negligence of the United States or its contractors.

c. Maintain and operate the project after completion in accordance with regulations prescribed by the Secretary of the Army.

d. Accomplish without cost to the United States all alterations and relocations of buildings, transportation facilities except railroad bridges and approaches, storm drains, utilities, and other structures and improvements made necessary by the construction.

e. Prevent encroachment on any of the flood protection structures including ponding areas and, if ponding capacity is impaired, provide substitute storage or equivalent pumping capacity promptly, without cost to the United States.

f. Enter into a separate recreational cost-sharing agreement with the United States in connection with the recreational features of the project.

g. At least annually, inform affected interests of the limitations of the protection afforded by the project.

h. Contribute 50 percent of the first cost of recreational facilities including the value of lands, easements, and rights-of-way furnished for recreational access, safety, sanitation, and health purposes located outside the basic flood control project boundaries.

In addition to these items of local cooperation, the local interests must agree to:

- o Comply with applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, approved 2 January 1971, in acquiring lands, easements, and rights-of-way for construction and subsequent maintenance of the project and inform affected persons of pertinent benefits, policies, and procedures in connection with said Act.

- o Comply with section 601 of Title VI of the Civil Rights Act of 1964 (Public Law 88-352) and Department of Defense Directive 5500.11 issued pursuant thereto and published in Part 300 of Title 32, Code of Federal Regulations, in connection with maintenance and operation of the project.

REAL ESTATE

The project requires acquisition of approximately 87.37 acres in fee or easement by the local sponsor. Of the total acreage, 84.37 acres are for levee and floodwall construction and maintenance and 3 acres are for ponding. Lands required for recreation and relocation are all located on project lands identified above for levee construction and maintenance.

On lands to be used for recreation, the local sponsor will have to acquire a greater interest, either fee or easement, than the perpetual flood protection levee easement since that easement will not support recreation facilities. Lands affected by the project are mostly river bottom lands located in the floodplain. Approximately 10 acres are existing emergency levee lands and 6 acres are residential. Two single-family residences would be acquired. The estimated costs of right-of-way acquisition are \$590,000 and include costs for lands and damages, improvements, contingencies, Public Law 91-646 relocation payments, and administration.

VIEWS OF NON-FEDERAL INTERESTS

Formulation of the selected plan was coordinated with the following non-Federal interests:

- o The city of Portage
- o Wisconsin River Flood Control Committee
- o Department of Natural Resources, State of Wisconsin
- o Columbia County Board
- o Columbia County Planning and Zoning
- o Town of Lewiston
- o Town of Fort Winnebago
- o Town of Pacific
- o Town of Fairfield
- o Citizens for Sensible Zoning
- o Portage Canal Society

Based on this coordination, a 30 September 1983 letter was received from the city of Portage that expressed support for the selected plan, indicated a willingness to financially participate in construction of the project, and urged prompt implementation of the project. This letter is provided in Attachment 1 of this report. Other views are included in appendix J.

RECOMMENDATIONS

Considering all significant aspects including environmental, social, and economic effects, engineering feasibility, and the views of the local interests, I recommend that the plan for flood damage reduction at Portage, Wisconsin, generally as selected herein, be authorized for implementation as a Federal project, with such modifications as in the discretion of the Chief of Engineers may be advisable; at a total first cost of \$7,238,000, and with annual operation, maintenance and replacement costs presently estimated at \$10,000; provided that, except as otherwise included in these recommendations, the exact amount of non-Federal contribution shall be determined by the Chief of Engineers prior to project implementation, in accordance with the following requirements to which non-Federal interests must agree prior to implementation:

a. Provide without cost to the United States all lands, easements, and rights-of-way, including suitable borrow and dredged and excavated material disposal areas, as determined by the Chief of Engineers to be necessary for construction and maintenance of the project.

b. Hold and save the United States free from damages due to the construction and maintenance of the project, except for damages due to the fault or negligence of the United States or its contractors.

c. Maintain and operate the project after completion in accordance with regulations prescribed by the Secretary of the Army.

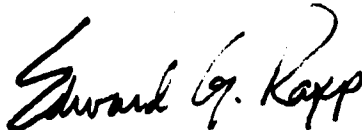
d. Accomplish without cost to the United States all alterations and acquisition of buildings, transportation facilities except railroad bridges and approaches, storm drains, utilities, and other structures and improvements made necessary by the construction.

e. Prevent encroachment on any of the flood protection structures including ponding areas and, if ponding capacity is impaired, provide substitute storage or equivalent pumping capacity promptly, without cost to the United States.

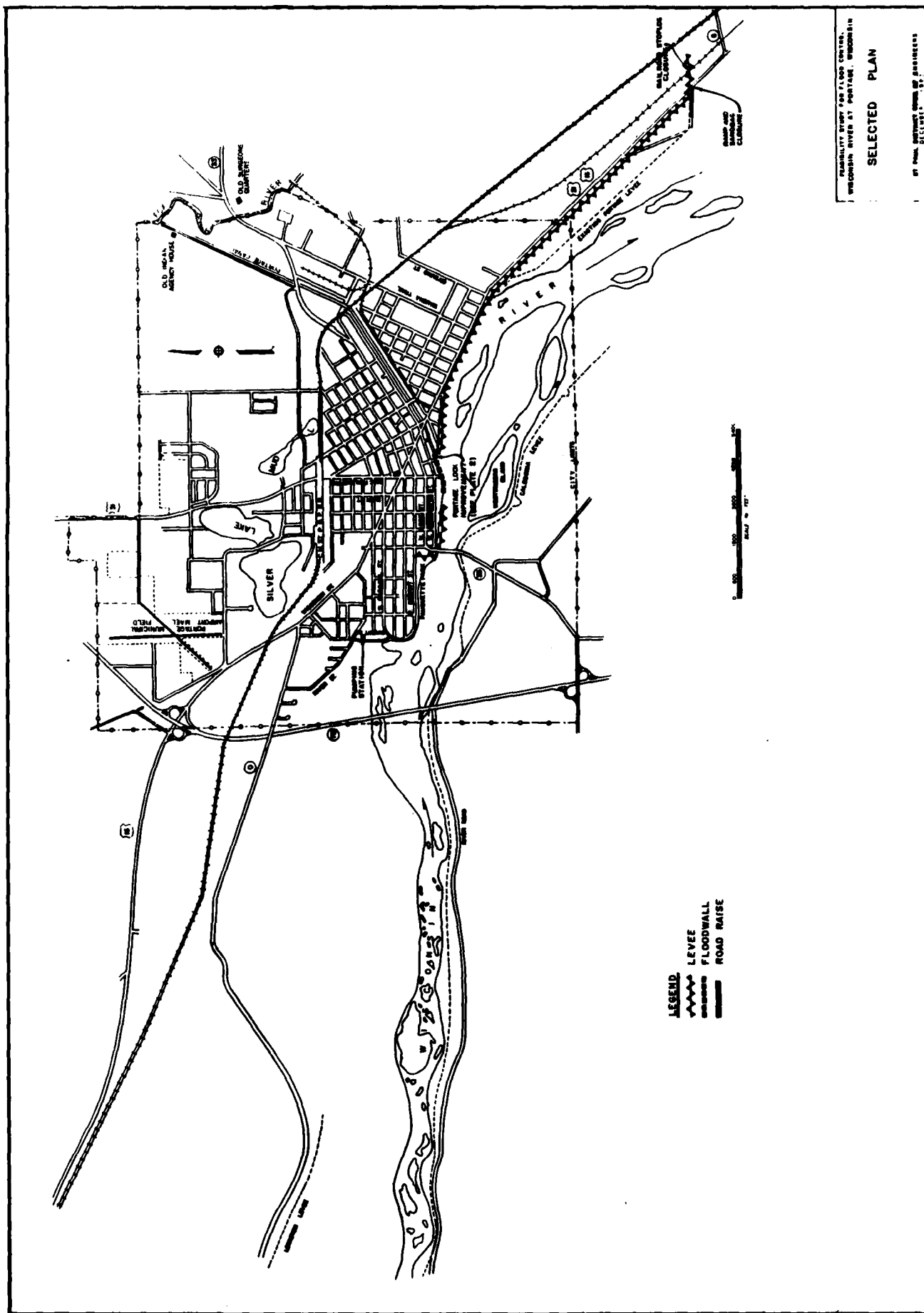
f. Enter into a separate recreational cost-sharing agreement with the United States in connection with the recreational features of the project.

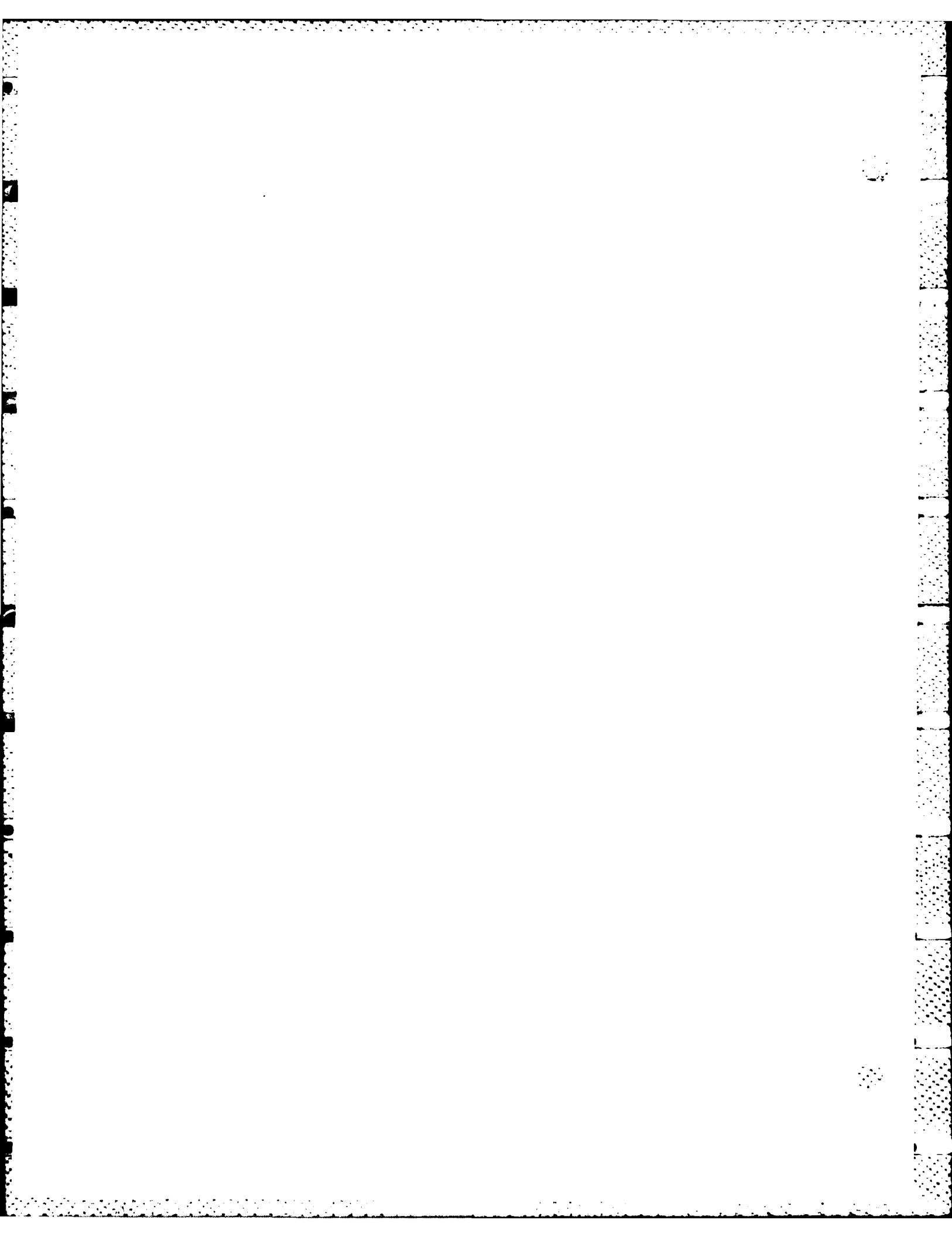
g. At least annually, inform affected interests of the limitations of the protection afforded by the project.

h. Contribute 50 percent of the first cost of recreational facilities including the value of lands, easements and rights-of-way furnished for recreational access, safety, sanitation and health purposes located outside the basic flood control project boundaries.



EDWARD G. RAPP
Colonel, Corps of Engineers
District Engineer

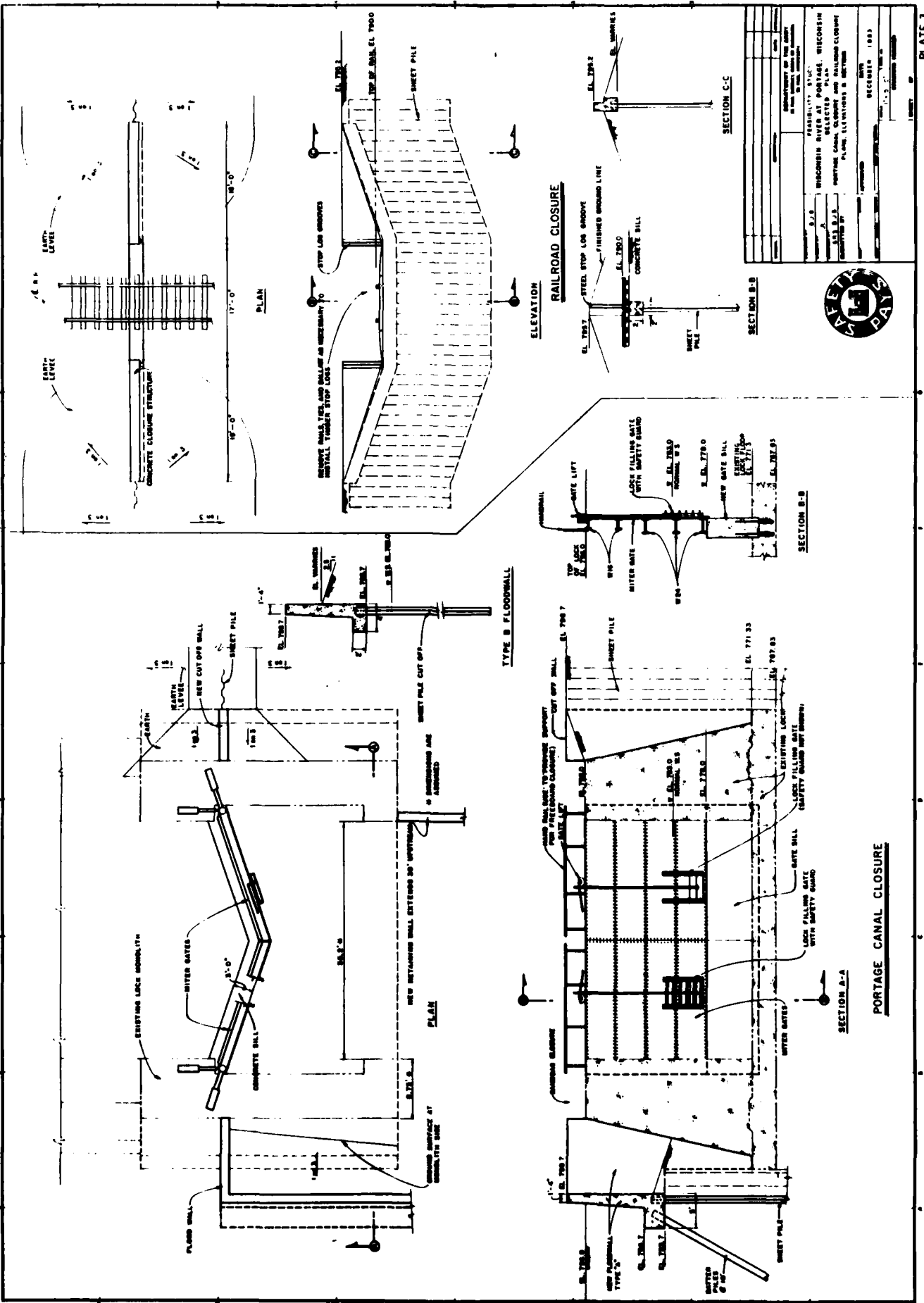






PROPOSED PROJECT FEATURES AT THE PORTAGE CANAL LOCK AREA

PLATE 2



PORTAGE CANAL CLOSURE PORTAGE CANAL CLOSURE AND RAILROAD CLOSURE PLAN, ELEVATIONS & SECTIONS	
SHEET NO. 1 OF 1	PROJECT NO. 1000 DATE: DECEMBER 1933
PREPARED BY: J. J. WILSON CHECKED BY: J. J. WILSON APPROVED BY: J. J. WILSON	



AD-A146 612

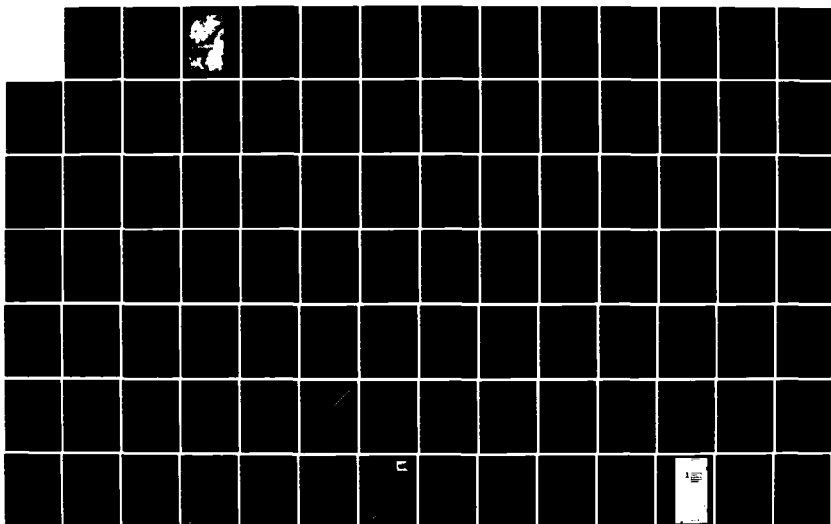
FEASIBILITY REPORT AND FINAL ENVIRONMENTAL IMPACT
STATEMENT WISCONSIN RIV. (U) CORPS OF ENGINEERS ST PAUL
MN ST PAUL DISTRICT DEC 83

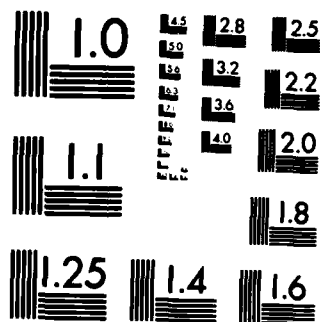
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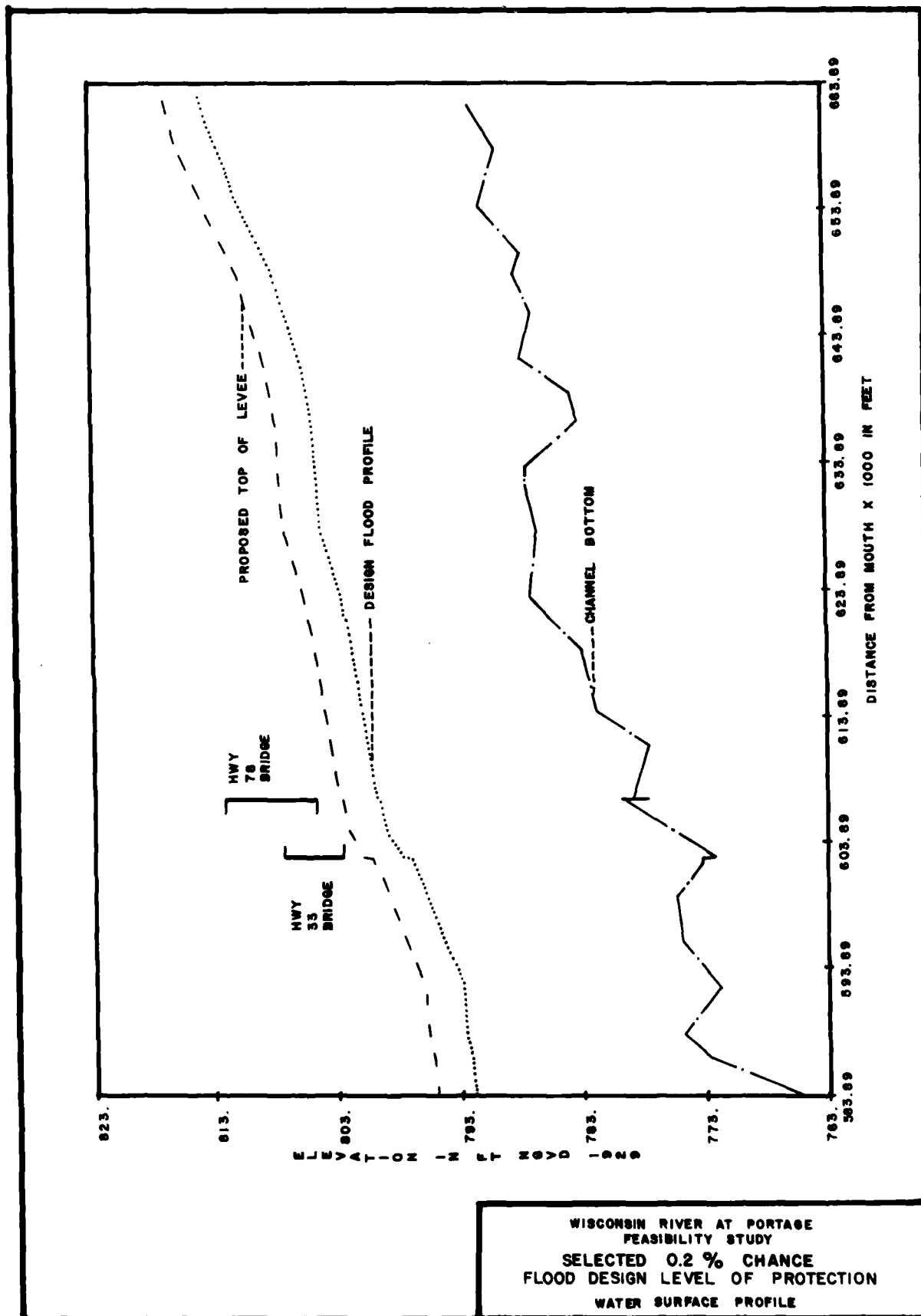
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COPY RESOLUTION TEST CHART





FEASIBILITY STUDY FOR FLOOD CONTROL
WISCONSIN RIVER AT HORTON
FLOODPLAIN MAP
PROJECT CONDITION
MAY 1968

PLATE 6

FINAL
ENVIRONMENTAL IMPACT STATEMENT
PROPOSED PLAN FOR FLOOD CONTROL
WISCONSIN RIVER AT PORTAGE, WISCONSIN

St. Paul District, Corps of Engineers
1135 U.S. Post Office and Custom House
St. Paul, Minnesota 55101

December 1983

EIS-1

ENVIRONMENTAL IMPACT STATEMENT

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FINAL
ENVIRONMENTAL IMPACT STATEMENT
Proposed Plan for Flood Control
Wisconsin River at Portage, Wisconsin

Abstract: The St. Paul District, U.S. Army Corps of Engineers, proposes to provide flood protection through levee construction and modification along the Wisconsin River at Portage, Wisconsin. The proposed plan includes constructing new levees, raising and widening existing levees, raising a road, replacing the riverward lock gates at the Portage Canal, and constructing a concrete floodwall upriver of the lock structure. Also, riprap would be placed on the riverward side of the levee from the State Highway 33 bridge downriver to Ontario Street. The levee would be approximately 15,700 feet long, up to 120 feet wide, and an average of 5 feet high, and would provide protection up to the 500-year flood event. This plan was selected for the following reasons: (1) it would be the most economically feasible to construct; (2) it would incorporate the Portage Canal without affecting its historic characteristics; (3) it would have minimal social disruption; and (4) it would not seriously degrade the natural environment. Although this plan would affect some riverine, floodplain forest, and wetland areas, it would provide protection to the wooded corridor along the Wisconsin River. Hence, no compensation is anticipated as a result of project construction. Alternatives to the proposed project that are discussed include:

- a. Nonstructural measures.
- b. Improvement of the existing Portage levee.
- c. Refinement to the Portage levee alignment.

If you would like further information on this statement, please contact:

Colonel Edward G. Rapp
District Engineer
U.S. Army Engineer District, St. Paul
1135 U.S. Post Office and Custom House
St. Paul, Minnesota 55101

FTS Telephone: 725-7501
Commercial Telephone: 612-725-7501

1.00 SUMMARY

MAJOR CONCLUSIONS AND FINDINGS

1.01 The selected plan must satisfy the specific need of flood protection for individuals residing in floodprone areas within Portage, be consistent with the historic and environmental importance of the area, and show a positive contribution to the National Economic Development (NED) objective. Of the alternative solutions evaluated during the feasibility study, only the selected plan satisfied the needs of the area while maximizing net economic benefits.

1.02 The selected plan consists of construction of a 500-year flood control levee at Portage with modifications to the existing alignment and careful incorporation of the historic Portage Canal Lock into the levee plan. For the remainder of the floodprone areas of the basin, participation in the floodplain regulation and flood insurance program is included in the selected plan. This plan has a benefit-cost ratio of 1.4 and net benefits of \$283,000. (See section 3.00 for a detailed description of the selected plan.)

1.03 Factors which influenced the choice of the selected alternative included economic feasibility, preservation of the Portage Canal, and floodplain forest and wetland protection at the downriver end of the project. The Portage Canal is a National Register of Historic Places property. Design of the recommended alternative stressed a way in which the canal would not be closed by the levee and a way in which the historic integrity of the lock structure would not be compromised. The placement of a levee along U.S. Highway 51 and 16 at the downriver end of the project, instead of modifying the existing levee near the river, would protect the floodplain forest and wetland areas along the river channel from future development.

AREAS OF CONTROVERSY

1.04 Major areas of concern were the closure of the Portage Canal by a levee alternative, validity of existing floodplain regulations, and equality of flood protection for all floodprone areas.

1.05 Many of the responses to the scoping letter reiterated concerns about the foreclosure of options which would keep the canal open to navigation. The Portage Canal Society, a local interest group, has been working for a number of years to open the canal and Wisconsin River Lock to small-craft navigation. The recommended alternative would not foreclose options for future small-craft navigation. See the Memorandum of Agreement in Attachment 1 or appendix G.

1.06 When the study began in 1976, a group of local citizens voiced concerns over the then existing floodplain regulations which had been adopted on the basis of floodplain information reports for the Wisconsin River (Corps of Engineers, 1972 and 1975) and U.S. Geological Survey floodprone area maps. These individuals specifically contested the hydrologic and hydraulic analysis on which the regulations were based. As a result, a new hydrologic and hydraulic analysis of existing floodplain conditions was conducted for the feasibility report. Using as a basis the technical information from this study, an updated flood insurance study has been completed and local floodplain regulations have been adopted.

1.07 During the citizens advisory committee meetings and the scoping process, many individuals suggested that all floodprone areas should benefit from the development of a flood damage reduction plan. It was also suggested that, should a feasible plan for flood control be developed for only a portion of the floodprone area, public opposition might develop in areas not receiving added flood protection. Through the hydrologic and hydraulic analysis that depicted Wisconsin River

discharges, it was determined that the effects on the Caledonia and Lewiston levee systems (i.e., through failure or overtopping) would not change from existing conditions.

UNRESOLVED ISSUES

1.08 There are no outstanding unresolved issues at this time.

RELATIONSHIP TO ENVIRONMENTAL PROTECTION STATUTES AND OTHER ENVIRONMENTAL REQUIREMENTS

1.09 The proposed plan has been reviewed for compliance with the National Environmental Policy Act, as amended; Section 404(b) of the Clean Water Act of 1977; the Endangered Species Act of 1973, as amended; Executive Order 11988, Floodplain Management; and Executive Order 11990, Protection of Wetlands. An analysis of impacts on prime and unique farmlands, as required by the Council on Environmental Quality memorandum of 30 August 1976, has also been conducted.

1.10 In accordance with the regulations of the Advisory Council on Historic Preservation (36 CFR Part 800), the cultural resources information contained in the draft environmental impact statement constituted the St. Paul District's request for the Council's comments on impacts to the Portage Canal, Zona Gale House, and Wauona Trail, National Register properties. In response to the Council's comments, as well as those of the Wisconsin State Historic Preservation Office, the St. Paul District, in consultation with these agencies, has prepared a Memorandum of Agreement. This document is included in Attachment 1 or appendix G.

1.11 Table 1 describes the relationship to applicable environmental requirements of the feasible alternative plans that were developed in detail.

TABLE 1

RELATIONSHIPS OF PLANS TO ENVIRONMENTAL REQUIREMENTS AND PROTECTION STATUTES
(PLAN TENTATIVELY RECOMMENDED: REFINEMENT TO THE PORTAGE LEVEE ALIGNMENT)

<u>Federal Statutes</u>	<u>No Action</u>	<u>Improvement of Portage levee</u>	<u>Refine to Portage levee</u>
Archeological and Historic Preservation Act, as amended, 16 USC 469, et seq.	Full	Full	Full
Clean Air Act, as amended, 42 USC 7401, et seq.	Full	Full	Full
Clean Water Act, as amended (Federal Water Pollution Control Act), 33 USC 1251, et seq.	N/A	Full	Full
Coastal Zone Management Act, as amended, 16 USC 1451, et seq.	N/A	N/A	N/A
Endangered Species Act, as amended, 16 USC 1531, et seq.	Full	Full	Full
Estuary Protection Act, 16 USC 1221, et seq.	N/A	N/A	N/A
Federal Water Project Recreation Act, as amended, 16 USC 460-1(12), et seq.			
Fish and Wildlife Coordination Act, as amended, 16 USC 661, et seq.	Full	Full	Full
Land and Water Conservation Fund Act, as amended, 16 USC 4601-4601-11, et seq.			
Marine Protection, Research and Sanctuaries Act, as amended, 22 USC 1401, et seq.	N/A	N/A	N/A
National Historic Preservation Act, as amended, 16 USC 470a, et seq.	Full	Full	Full
National Environmental Policy Act, as amended, 42 USC 4321, et seq.	Full	Full	Full
Rivers and Harbors Act, 33 USC 401, et seq.	N/A	N/A	N/A
Watershed Protection and Flood Prevention Act, as amended, 16 USC 1001, et seq.	N/A	N/A	N/A
Wild and Scenic Rivers Act, as amended, 16 USC 1271, et seq.			
Executive Orders, Memorandum, etc.			
Floodplain Management (E.O. 11988)			
Protection of Wetlands (E.O. 11990)	Full	Full	Full
Environmental Effects Abroad of Major Federal Actions (E.O. 12114)	N/A	N/A	N/A
Analysis of Impacts on Prime and Unique Farmlands (CEQ Memorandum, 30 Aug 76)			
<u>Land Use Plans</u>			
<u>State and Local Policies</u>			
<u>Required Federal Entitlements</u>			
<u>Water Pollution Control Act Section 404(b)(1) Permit</u>			

NOTES: The compliance categories used in this table were assigned on the basis of the following definitions:

- Full compliance (FC) - All requirements of the regulation have been met for current stage of planning.
- Partial compliance (PC) - Some requirements of the regulation have not been met for current stage of planning.
- Noncompliance (NC) - Violation of requirement of the statute, Executive Order, policy, etc.
- Not applicable (N/A) - Regulation is not applicable.

2.00 NEED FOR AND OBJECTIVES OF ACTION

STUDY AUTHORITY

2.01 On 14 June 1972 the House Committee on Public Works adopted a resolution authorizing the Board of Engineers for Rivers and Harbors to review the reports on the Wisconsin River and its tributaries that were submitted in House Document No. 259, 71st Congress, 2nd session, with particular reference to improvements for flood control and allied purposes at Portage, Wisconsin.

PUBLIC CONCERNS

2.02 Through public meetings, reports, and correspondence, local interests and various government agencies identified the following concerns: flooding along the Wisconsin River, particularly in the Portage, Lewiston, and Caledonia areas; equal flood protection for all floodprone areas; maintaining the historic character of the Portage Canal; validity of existing floodplain regulations; and preservation of floodplain forests, wetlands, and riverine environments. A detailed discussion of the public involvement program is presented in the feasibility report, appendix J, and in section 6.00 of this document.

PLANNING OBJECTIVES

2.03 The general planning Principles and Guidelines for conducting feasibility studies require that all federally assisted water resource projects be planned to further the national economic development (NED) objective. This objective is to contribute to economic development while protecting the environment.

2.04 The specific study objectives are as follows:

- a. Provide an acceptable flood control plan for the Portage area.
- b. Develop a hydrologic and hydraulic analysis of existing floodplain conditions which would provide a basis for floodplain regulation and flood insurance.
- c. Develop a flood protection plan that would minimize adverse impacts on the natural resources (i.e., primarily on the wetland, floodplain forest, and riverine habitats) in the study area.
- d. Identify and preserve significant archeological, historic, and architectural resources.
- e. Preserve the historic integrity of the Portage Canal, a National Register of Historic Places property, through design considerations which minimize adverse impacts.

In addition, several State and local objectives were identified and are presented in appendix A.

3.00 ALTERNATIVES

3.01 Several alternative solutions for flood protection along the Wisconsin River in the Portage area have been identified. This section discusses all alternatives considered. It is divided into three parts: (1) alternatives that were not considered in detail (plans eliminated from further study); (2) alternatives that were studied in detail; and (3) an evaluation and comparison of the alternatives discussed in item 2 above. This discussion will also identify the national economic development, least environmentally damaging, and selected alternatives. Refer to appendix A, pages A-24 through A-67, for a more detailed description and map of each alternative discussed on the following pages.

PLANS ELIMINATED FROM FURTHER STUDY

Raising and Widening the Portage Levee with a New Lewiston Levee

3.02 This alternative would raise and widen the Portage levee along its existing or alternative alignment with the addition of a new Lewiston levee along the Chicago, Milwaukee, St. Paul, and Pacific Railroad tracks west of Portage. Overall, the levees would be constructed to provide standard project flood protection for the city of Portage and to prevent Wisconsin River overflows into the Fox River basin. This alternative was eliminated from detailed study because the new Lewiston levee lacked incremental economic feasibility. In addition, this alternative could increase flood stages on the Caledonia side of the river.

Ring Levee Around Ward 1

3.03 The various components of this alternative were essentially derived from a recommendation made by the Fish and Wildlife Service during stage 2 studies (see Appendix J, pages J-37 and J-38). Some of the components were eliminated (i.e., portions of subparts 2 and 5 and subpart 3) due to either sufficient or insufficient existing ground elevations for levee construction. Other components (i.e., subparts 1, 2, 4, and 5) were used to form the base components of this alternative. This alternative would raise and widen the existing Portage levee from Summit and West Carroll Streets in Ward 8 downriver to the intersection of U.S. Highway 51 and 16 and Ontario Street in Ward 1. From this location the ring levee would parallel Ontario Street to the Chicago, Milwaukee, St. Paul, and Pacific Railroad tracks and then extend northwest across the Portage Canal to higher ground. A modified ring levee alignment would cross the railroad tracks at Wauona Trail and run northeast to approximately Denning Street, then northwest across the Portage Canal, before tying into higher ground. The benefit-cost ratio for this alternative is 0.9. The alternative was eliminated from further study because of the lack of economic feasibility, adverse effects on the Portage Canal, adverse social impacts, and lack of local acceptability.

Improvement of the Caledonia Levee

3.04 The existing Caledonia levee located south of Portage would be upgraded to provide protection for Caledonia Township, the town of Caledonia, and the Pine Island Wildlife Area. This plan was eliminated because it lacked economic feasibility (benefit-cost ratio 0.1) and because of adverse environmental impacts.

Improvement of All Levees

3.05 This alternative would strengthen, widen, extend, and raise the existing Portage, Lewiston, and Caledonia levees. The benefit-cost ratio for this alternative is less than unity. In addition, this alternative would adversely impact floodplain woodland communities (i.e., plants and animals) and prehistoric archeological sites along the Caledonia levee and in Portage.

Caledonia Outlet

3.06 This alternative would provide an opening in the Caledonia levee to reduce flood flows to the Portage and Lewiston areas by diverting them into the Pine Island Wildlife Area. This alternative is close to economic feasibility with a benefit-cost ratio of 0.92. However, because of the potential adverse effects on the Pine Island Wildlife Area, County Roads 78 and 33, and Interstate 90-94, this alternative was eliminated from detailed consideration. In addition, the overflow area in the Pine Island Wildlife Area does not have sufficient capacity to store the estimated 250,000 acre-feet of water from a 1-percent chance flood.

Channel Modification

3.07 This alternative considered both dredging of and clearing debris from the Wisconsin River channel between Pine Island and the mouth of the Baraboo River, a distance of approximately 11 miles. Both dredging and

clearing plans would lower the 1-percent and standard project flood events; however, sufficient freeboard (on all levees) would not be available to provide full protection from the 1-percent flood, while the standard project flood would overtop all levees in the project area. In addition, both plans would have significant impacts on the bottomland and riverine environments, known archeological sites, and present and future recreation uses of the Wisconsin River within the study area. The benefit-cost ratios are 0.3 and 0.8 for the two dredging plans and 0.6 for clearing.

Channel Diversion to the Baraboo River

3.08 This alternative consists of a diversion channel from the Wisconsin River to the Baraboo River. The channel would be designed to carry either the 1-percent or standard project flood flows. Flood related damages to Portage and the Fox River basin would be prevented; however, widespread flooding would occur in Caledonia Township because of the inability of the Baraboo River to handle the Wisconsin River discharges. The benefit-cost ratios for this alternative are 0.2 and 0.1 for the 1-percent and standard project floods, respectively. This alternative would also have unacceptable adverse effects on social, cultural, and environmental resources.

Channel Diversion to Long Lake

3.09 This alternative would divert flood flows from the Wisconsin River upstream of Portage through Caledonia Township and back into the Wisconsin River via Long Lake near the mouth of the Baraboo River. This alternative would prevent flood related damages, up to the design flood, for the Portage area and the Fox River basin. However, the diversion channel would increase the potential for flooding downstream of the diversion outlet, destroy existing wetlands in the Pine Island Wildlife Area and Long Lake, disturb known archeological sites, and negatively affect local residences and recreation resources. The benefit-cost ratio is 0.21.

Channel Diversion to Big Slough

3.10 This alternative would divert flood flows from the Wisconsin River through Lewiston Township to Big Slough in the Fox River basin. Widespread flooding would occur in Lewiston Township because Big Slough could not handle the diverted flows. Also, flooding to communities in the Fox River basin would worsen. Additionally, adverse effects to existing wetlands and their wildlife communities would result from lowering of the water table and direct destruction of habitat. The northern pike spawning area in Big Slough would also be adversely affected. The benefit-cost ratio for this alternative is 0.08.

Increasing Flood Storage at Existing Dams

3.11 Three separate plans that would increase storage at existing reservoirs were considered. Each plan is identified below with a brief explanation of why it was not recommended for further study.

3.12 Lower Operating Pools - The first plan would require lowering, by 5 feet, the operating pools for the Castle Rock, Petenwell and Du Bay hydropower dams which are located 45, 48, and 134 miles, respectively, upriver from Portage. Normal operating procedures for these dams are to lower their operating pools 4 to 5 feet in the fall to provide storage capabilities for potential spring floodwater. This effort currently reduces the 1-percent chance flood at Portage by 10,000 cfs. To be more functional, these dams would have to reduce flood flows at Portage an additional 25,000 cfs. Because summer and fall floods are similar in occurrence and magnitude to spring floods, the proposal to permanently reduce the operating pools at the three hydropower dams would do little to reduce the 1-percent chance flood at Portage. Also, the power generating capacity of the three dams would be reduced by about 10 to 15 percent.

3.13 Raise Existing Dams - The second plan would raise by 5 feet the existing Castle Rock, Petenwell and Du Bay hydropower dams for floodwater storage. The effects of this proposal would be similar to those discussed above. In addition, the added costs of raising the dams, installing 45 additional tainter or flood gates, floodproofing powerhouse walls, and raising approximately 15 miles of levees upriver of these structures would make this proposal completely uneconomical.

3.14 Modify Operation of Prairie du Sac Dam - The third plan would modify the operating procedures for the Prairie du Sac Dam situated about 25 miles downstream from Portage. Lake Wisconsin, about 12 miles long, is formed by the dam. During both normal and flood conditions, the operational policy is to maintain a constant elevation of 774 feet above mean sea level at the gated spillways. The only exception is when the lake level is drawn down in anticipation of downstream flooding. The gated spillway capacity of the dam is about 91,000 cfs. Hydraulic studies indicate that floods up to and including the standard project flood could be passed through the gates while maintaining a pool elevation of 774 feet at the dam. According to historic high-water marks, the record flood in 1938 and other large floods in 1960 and 1973 caused a rise of less than 1 foot in Lake Wisconsin. Hence, existing operating procedures would not affect upstream flood conditions at Portage. Lowering Lake Wisconsin during floods also would not affect flood conditions at Portage because of the distance involved.

New Reservoirs

3.15 This plan considered the possibility of constructing new reservoirs on the main stem and tributaries of the Wisconsin River above Portage. These reservoirs would need to control flood flows of 25,000 and 85,000 cfs for the 1-percent and standard project floods, respectively. There are currently 21 small reservoirs and 3 large hydropower dams on the Wisconsin River above Portage. Hence, there is little potential for development of new reservoirs on the main stem.

Also, the size of a dam needed to control a drainage area of 8,000 square miles would preclude it as a practical alternative. The only significant uncontrolled tributaries are the Lemonweir, Yellow, Little Eau Pleine and Rib Rivers which are 33, 46, 123, and 151 miles, respectively, above Portage. Their drainage areas vary from 400 to 800 square miles, which comprises only 5 to 10 percent of the drainage area of Portage. Thus, given the distances involved, relatively small drainage areas, and high costs as compared to benefits gained, new tributary reservoirs were eliminated as viable alternatives. Also, any new reservoir would result in the loss of a significant amount of wildlife habitat, numerous known historic and prehistoric sites, and recreational uses of the river's main stem and tributaries.

WITHOUT CONDITION (NO ACTION)

3.16 With the no action alternative, no flood control measures (structural or nonstructural) would be implemented, and present conditions would prevail. Under these conditions, the approximately 18 miles of discontinuous levees on both sides of the Wisconsin River upstream and downstream of Portage would be relied upon for future flood protection. On the south side of the river, the 9.5-mile Caledonia levee potentially protects from flood damages several small farms, a portion of Interstate Highway 90-94, and the Pine Island Wildlife Area. The 5-mile Lewiston levee and the 3 1/4 mile Portage levee on the north bank of the river reduce the potential for flooding of city property; farmlands; the Chicago, Milwaukee, St. Paul, and Pacific Railroad; and the Fox River basin. Failure of these levees would result in average annual damages of \$954,000. In general, the levees are narrow, steeply sloped, and consist predominantly of sand. They are vegetated except for a segment of the Portage levee which is faced with thin grouted riprap. Loose rock facing has been used at scattered locations to repair erosion. Although the levees have not been breached or overtopped since the record flood of 1938, they were not built to permanent flood control standards. They were built haphazardly over a 100-year period with different portions completed as money became available or when the river threatened to

breach a section. Also, a small section of the Portage levee is formed by the lock structure of the Portage Canal. The upper and lower gates of this structure have not been maintained for many years and are considered to be a weak link in this portion of the levee system. Failure of this structure during a flood event would jeopardize Ward 1 and would allow floodwaters to pass through the southwest portion of Portage and into the Fox River basin.

In addition to relying on the levee system for flood protection, the county and city of Portage, as part of the existing flood forecast, warning, and temporary evacuation plan of the county, maintain continuous contact with upstream reservoir operating stations for discharge information to help forecast potential flood events. Annual maintenance of the levee system is currently and would remain the responsibility of the Wisconsin Department of Natural Resources. Flood insurance and floodplain regulations would continue to be a way of life for persons living in the floodprone areas of Portage and Columbia County.

PLANS CONSIDERED IN DETAIL

Improvement of the Existing Portage Levee

3.17 This alternative involves raising and widening the existing Portage levees to provide 500-year flood protection (figure 1). The main features included in this alternative are described below:

- a. Raising Summit Street between West Carroll and River Streets in Ward 8.
- b. Raising the levee in Pauquette Park between Conant and Edgewater Streets.
- c. Placing a new levee section along the river from the State Highway 33 bridge downriver to almost Dunn Street.

d. Replacing the riverward lock gates of the Portage lock structure and extending the north wing wall by constructing a floodwall upriver approximately 550 feet to just above MacFarlane Road.

e. Raising the existing levee along its current alignment from the south abutment of the Portage lock structure to County Road G and U.S. Highway 51 and 16.

In addition to the above levee modifications, a closure structure would be installed at the Chicago, Milwaukee, St. Paul, and Pacific Railroad levee intersection near County Road G, a portion of U.S. Highway 51 and 16 would be raised at the downstream end of the project where the levee ties into higher ground, and excess seepage and blocked drainage would be controlled by interior drainage facilities including one pumping station. Implementation of this plan would be a joint Federal and local effort, with a total first cost of \$7,539,000 and a benefit-cost ratio of 1.35.

3.18 Beginning with segment a (Summit Street raise) through a portion of segment e (to Ontario Street), the proposed levee would be widened riverward with a 1 on 3 side slope due to existing residential and commercial development within the city of Portage. As a result, the approximately 7,650 feet of levee would extend out into the floodplain forest and riverine environment a distance of 50 to 120 feet. A total of 0.24 and 11.0 acres of each environment, respectively, would be affected. In an effort to minimize this habitat loss, a 1 on 1 riverward slope was considered for this portion of the levee system. However, given the extent of community development along the river, potential significant seepage problems, and the importance of maintaining structural integrity of the sand levees, the 1 on 1 riverward slope was not recommended as a project feature. From Ontario Street downriver to County Road G, the existing levee would be widened up to 280 feet. This portion of the levee would be approximately 9,000 feet long and would require approximately 72 and 9 acres each of the floodplain forest and wetland communities found in this area. Although not directly required for this

alternative, an additional 95 and 31 acres of the floodplain forest and wetland community landward of the levee could also be affected by this alternative. This effect would be through future development practices since the area would essentially have been removed from a floodprone classification except for extremely large floods.

3.19 Fill material needed for the construction of this levee proposal would be obtained from one or more of the existing quarries located within 2 miles of the project site. Since each of the segments would be constructed independently of each other, the fill material could be obtained from the quarry nearest its corresponding construction site. The following table provides the approximate direction, distance, and potential travel corridor for each segment to a potential borrow source within the project area.

<u>Segment</u>	<u>Location</u>	<u>Distance to Site</u>	<u>Travel Corridor</u>
a	NE of Portage	1 mile	County Road 0 to River Street
b&c	SE of Portage (Blackhawk Park Area)	1 mile	Wood Street to Caledonia Street to Highway 33
e	SE of Portage	2 miles	U.S. Highway 51 and 16.

An alternative source for all or a portion of the fill material is a shallow backwater area of the Wisconsin River lying adjacent to segment e between the Portage Canal and Ontario Street.

3.19a The Portage Canal and lock structure (segment d) is currently listed on the National Register of Historic Places for Wisconsin. Improvement of the Portage levee would require crossing the Portage lock structure where it enters the Wisconsin River. This crossing would

require replacement of the riverward gates and extension of the north abutment and wing wall approximately 550 feet upriver.

Refinement to the Portage Levee Alignment

3.20 This alternative would incorporate all of the previous alternative north of Ontario Street. From Ontario Street downriver to the junction of County Road G and U.S. Highway 51 and 16, the existing levee alignment would be abandoned and a new levee would be constructed to parallel the south side of the highway (figure 2). This new levee segment would be approximately 7,700 feet long and 190 to 250 feet wide for the 100- and 500-year flood events, respectively. This levee alignment would also affect the floodplain forest and wetland environments found in this area. Approximately 41 and 11 acres, respectively, would be required for levee construction. However, approximately 145 and 29 acres of the floodplain forest and wetland area would remain outside the levee along the river. The total first cost would be \$7,238,000 and the benefit-cost ratio is 1.4. This alternative alignment would require 1,300 feet less for levee construction at the downriver end of the project, retain in their existing state some of the floodplain forest and wetland areas immediately along the Wisconsin River, and be the most economical to construct. Thus, this alternative (i.e., the 500-year plan) was selected as the NED plan and is recommended for construction.

Environmental Resources Wildlife Management Area	Base Condition Two in proximity of study area: Swan Lake - 1.5 miles east of Portage, covers 1,320 acres of wetland, prairie, woodland and open water environs; Pine Island - across the river from Portage, covers 4,500 acres of old field, oak forests, and wetlands.	No Action No impact.	Improvement of Portage Levee No impact.	Refinement to Portage Levee Alignment No impact.	Nonstructural Alternative No impact.
Natural Resources Areas	Two located west of Portage. Sandhill crane area - lies north of the Wisconsin River and north of the Sauk County line; Leopold Memorial Reserve - located south of the Wisconsin River in Columbia County, consists of bottomland, forests, scrub-shrub, and old field habitats. Aldo Leopold wrote about this area.	No impact.	No impact.	No impact.	No impact.
Threatened and Endangered Species	Federal endangered: peregrine falcon; State threatened: red-shouldered hawk, speckled chub, and black buffalo.	No impact.	No impact.	No impact.	No impact.
Cultural Resources Portage Canal	Site on the National Register of Historic Places (NRHP)	Site on NRHP. Impact: Gates on Wisconsin River Lock will continue to deteriorate.	Site on NRHP. Impact: Replacement of lock gates. Levee and floodwall tie into lock structure.	Site on NRHP. Impact: Replace-ment of lock gates. Levee and floodwall tie into lock structure.	Site on NRHP. Impact: Early commercial structures associated with canal's early history would be removed.
Wauona Trail	Site on NRHP.	Site on NRHP. Impact: None.	Site on NRHP. Impact: Minimal; existing levee height would be increased slightly.	Site on NRHP. Impact: Minimal, existing levee height would be increased slightly.	Site on NRHP. Impact: Possible beneficial effect from removing recent structures adjacent to the trail.

<u>Significant Resources</u>	<u>Base Condition</u>	<u>No Action</u>	<u>Improvement of Portage Levee</u>	<u>Refinement to Portage Levee Alignment</u>	<u>Nonstructural Alternative</u>
Zona Gale House	Site on NRHP.	Site on NRHP. Impact: None.	Site on NRHP. Impact: Introduction of undesirable visual element from new flood-wall construction.	Site on NRHP. Impact: Introduction of undesirable visual element from floodwall construction.	Site on NRHP. Impact: None.
Aldo Leopold Shack	Site on NRHP.	Site on NRHP. Impact: None.	Site on NRHP. Impact: None, site above 100-year floodplain.	Site on NRHP. Impact: None; site above 100-year floodplain.	Site on NRHP. Impact: None.
Nonassessed Cultural Resources	Recorded and unrecorded sites exist in project area.	Unrecorded archeological sites may continue to be impacted by development. Historic sites may deteriorate.	Potential exists for impacting unrecorded archeological sites along levee.	Potential exists for impacting unrecorded archeological sites along levee.	Potential eligible NRHP structures would be removed from the floodplain.
<u>Recreation Resources</u> Portage Canal	Same as for cultural resources. Currently not used for recreation activities. However, a potential for such use exists.	No change.	Replacement of lock gates permits future use as desired.	Replacement of lock gates permits future use as desired.	No impact.
Pauquette Park	Active use park with picnic units, play equipment and a ball field. Existing levee goes through park.	Flooding would continue on the riverward side.	Landward side would be protected. Some facilities relocated in the park.	Landward side would be protected. Some facilities would have to be relocated in the park.	No impact.
Riverside Park	Picnic/wayside rest area. Picnic shelter, parking space.	No change.	As levee would "move" riverward, no effect. Park would be expanded onto levee.	As levee would "move" riverward, no effect. Park would be expanded onto levee.	No impact.

<u>Significant Resources</u>	<u>Base Condition</u>	<u>No Action</u>	<u>Improvement of Portage Levee</u>	<u>Refinement to Portage Levee Alignment</u>	<u>Nonstructural Alternative</u>
Boat Ramp	Ramp into water from city streets. Continued flooding. Existing ramp would be unusable. No associated support facilities, such as parking.	No change.	New ramp could be incorporated into project.	Existing ramp would be unusable. New ramp could be incorporated into project.	No impact.
Levee Top Path	Walking path on top of the levee. Benches along the path in the vicinity of Riverside Park.	No change.	An improved path could be provided on levee.	An improved path could be provided on levee.	No impact.

4.00 AFFECTED ENVIRONMENT

ENVIRONMENTAL CONDITIONS

4.01 Portage is situated on the divide between the watershed of the Wisconsin and Fox Rivers, at a point where the two rivers are only 1.5 miles apart. The Wisconsin River flows through the central part of Wisconsin, south and then west (at Portage) toward the Mississippi River. The Fox River, which lies in the east central part of the State, flows in a northeasterly direction toward the Green Bay area on Lake Michigan. The drainage areas of the Wisconsin and Fox Rivers above Portage are about 8,150 and 72 square miles, respectively. At normal river stages, the Wisconsin River at Portage is about 6 feet above the elevation of the Fox River.

4.02 Much of the area surrounding Portage is rural. The predominant land use (60 percent) is agriculture followed by natural undeveloped areas (31.5 percent). Agricultural lands include cultivated lands, pasture lands and pine plantations. Natural areas include floodplain forests, oak-hickory forests, mixed successional forests, several types of wetlands, water, swamp forests, and mixed grasslands. This natural environment in conjunction with the Wisconsin and Fox Rivers, provides the necessary life requisites for a diversity of mammals, birds, reptiles, amphibians, and fish which are known to inhabit the study area.

4.03 Of the natural areas surrounding Portage, floodplain forests and wetlands are the two dominant types, comprising roughly 22 and 8 percent, respectively, of the land. The largest wetland area is located between the floodplain forests of the Fox and Wisconsin Rivers just east of the Portage Canal. These are considered to be high quality areas and some of the best wildlife habitat in the region.

4.04 Water quality of the Wisconsin River is regulated by the Wisconsin Department of Natural Resources through Chapter 144 of the Wisconsin Statutes and Chapter NR102 and NR104 of the Wisconsin Administrative Code. The lower Wisconsin River (in which Portage lies) and Lake Wisconsin are classified to support fish and aquatic life and recreational uses. Biological data collected from the Wisconsin River, in the Portage area, indicate that the State standards are being met although enriched to seriously enriched conditions do occur in the river. However, this does not mean that some violations of the standards do not occur from time to time.

4.05 The cultural resources of the Portage area are numerous and varied. The archeology of this area probably spans a time period from 1100 B.C. to historic times, although very early sites have not currently been identified. Historic Portage contains many architectural structures which exemplify its early position in transportation, military history, and industrial development.

4.06 The city has been active in providing for the recreation needs of its residents. Currently, the city has approximately 175 acres in 17 areas. The city has six parks on or near the Wisconsin River but no recreation areas on the Fox River. In fact, there is little public recreation development along the Fox River in the vicinity of Portage.

4.07 Portage lies in a primarily agricultural area and serves as a regional service center. Over the past decades, employment has shifted from agriculture to manufacturing.

4.08 Portage is the largest community in Columbia County and has a current population of 7,896. It has seven major manufacturers, four of which are among the ten largest manufacturing employers in Columbia County. Portage also has four of the five largest nonmanufacturing employers (excluding public schools and public administration) in Columbia County.

SIGNIFICANT RESOURCES AND CONCERNS

4.09 Significant resources identified on the basis of public interest, law (includes an evaluation of the resource categories identified in Section 122 of the River and Harbor Act of 1970, Public Law 91-611), standards, and/or technical criteria include floodplain forests (palustrine forested wetlands), wetlands (palustrine emergent wetlands), endangered species, wildlife management areas, natural resource areas, Wisconsin River (riverine wetland), and cultural, recreation, and social resources. A summary of these resources is presented in the following paragraphs. The cultural and environmental appendix contains more detailed information including species lists.

Floodplain Forests

4.10 The Wisconsin River in the Portage area maintains a fairly wide and well developed floodplain forest community along its banks and on many of its numerous small islands. The dominant tree species along the shoreline are silver maple, cottonwood, and river birch. Moving away from the river, green, white, and black ash and American elm become more abundant in both the shrub and canopy layers. The shrub layer is intermittent with dense patches of prickly ash, wild black currant, white mulberry, and common elder. These bottomland areas, especially those located west of Portage, are considered to be some of the best in the State in terms of wildlife productivity.

Wetlands

4.11 Wetlands are second only to floodplain forests as the most common form of natural land use in the Portage area. Most of the wetlands adjacent to the Fox River to the north and east of Portage are scrub-shrub wetlands, while those along the Wisconsin River and in the many ponds, potholes, and old river oxbox areas are emergent wetlands. Both types of wetlands maintain a diverse assemblage of vegetation including

maple, dogwood, alder, willow, bulrush, spike rush, phragmites, sedges, and cattails. These areas provide ideal habitats for a variety of animal species and supply food and shelter for both resident and transient wildlife populations. As a result, the diversity of waterfowl and other water-associated birds, small and large mammals, reptiles, and amphibians in this area is considered to be great as compared to the region or the rest of the State.

Wisconsin River

4.12 The Wisconsin River, in the Portage area, flows through or adjacent to a wide variety of aquatic habitats including oxbow lakes, side channels, slow-moving shallow backwater areas, swift water environs, and many types of wetlands. The substrate is primarily shifting sand, although lesser amounts of silt, gravel, boulders, and rocks are also present. Flow rates tend to vary seasonally and annually depending on climatic conditions. During low-flow periods, large sand flats develop along the main channel and in the many side channels or backwater areas. Also, some State water quality standards may be exceeded during low-flow periods; however, overall water quality for the river tends to be very good. The river provides food, shelter, and spawning requirements necessary to support a diverse fishery. Of the 40 species known to exist in the Portage area, the primary sport species are walleyes, northern pike, sauger, largemouth bass, bluegills, and perch. Other species include minnows, carp, freshwater drum, buffalo, bullheads, and bowfin.

Wildlife Management Areas

4.13 Two Department of Natural Resources wildlife management areas are close to the designated study area and provide prime wildlife and recreation resources. The Swan Lake Wildlife Management Area is about 1.5 miles east of Portage along U.S. Highway 51 and 16. It encompasses approximately 1,320 acres consisting of wetlands, prairie, woodland, and open water environs which provide breeding habitat for numerous waterfowl

and other wildlife species. Across the Wisconsin River, immediately south and west of Portage, the Pine Island Wildlife Management Area covers approximately 4,500 acres of old field and oak forest type environments. Scattered throughout this area are various types of wetlands including emergent and scrub-shrub. Ruffed grouse, ring-necked pheasant, white-tailed deer, squirrels, quail, and gray partridge are some of the wildlife species known to inhabit these areas. Canada geese are also present but only as migrants in the spring and fall. Both wildlife management areas are not used strictly for wildlife management purposes since they are also designated as multirecreational use areas.

Natural Resource Areas

4.14 The International Crane Foundation has identified an area west of Portage, immediately north of the Wisconsin River, and north of the Sauk County line as containing some of Wisconsin's most productive sandhill crane habitat. Although the sandhill crane is no longer on the Federal list of threatened and endangered species, the future existence of marsh grass meadows will play an important role in the continued recovery and stabilization of this important migratory wading bird species.

4.15 Immediately south of the sandhill crane area and across the Wisconsin River is the Leopold Memorial Reserve. This reserve is a National Historic Landmark and an area of extreme importance. It is composed of approximately 1,200 acres of land along the Wisconsin River in Sauk County, Fairfield Township, T13N, R7E, and Government Islands 8 and 9 in the Wisconsin River, Columbia County. It was here, in and around his still standing cabin, that the late Aldo Leopold wrote some of his famous works. He also wrote about the immediate area. Leopold is often called the "Father of Wildlife Management," and is considered a great naturalist, writer, and educator.

Threatened and Endangered Species

4.16 The peregrine falcon is the only federally listed threatened or endangered species known to occur in Columbia County. This species is a transient during spring and fall migration, although potential reintroduction sites along the Wisconsin River have been identified. A number of other species of animals which occur in the general study area are considered to be of State significance. These include the following bird and fish species: double crested cormorant, bald eagle, osprey, common tern, Forster's tern (endangered), Cooper's hawk, great egret, red-shouldered hawk, speckled chub, and black buffalo (threatened). Of these species, only the red-shouldered hawk, speckled chub, and black buffalo are known to occur in the immediate area. The red-shouldered hawk nests in the floodplain forests, while the speckled chub and black buffalo inhabit the Wisconsin River in areas where fast current flows over sand shoals and in backwater areas, respectively.

Cultural Resources

4.17 Within the study area, seven properties are presently listed on the National Register of Historic Places. These properties include the Fort Winnebago Site; Fort Winnebago Surgeon's Quarters; the Fox-Wisconsin Portage Site (Wauona Trail); the Zona Gale House; the Old Indian Agency House; the Portage Canal; and the Aldo Leopold Shack. Four of these properties (Wauona Trail, Zona Gale House, Portage Canal, and Aldo Leopold Shack) have been presented in the table of comparative impacts because of their location with respect to the Portage flood control project. A general description of all these resources can be found in the cultural resources appendix. Specific information on the description and significance of the Portage Canal, Zona Gale House, and Wauona Trail is presented in the National Register of Historic Places nomination forms included in the cultural resources appendix.

Recreation Resources

4.18 The city of Portage currently maintains five recreational areas that would be directly affected by those alternatives which would require structural modification of the existing levee. These areas include: the Portage Canal and its lock structure, Pauquette Park, a boat ramp on the Wisconsin River near Sunset Park, Riverside Park, and the walkway on top of the existing Portage levee. A more detailed description of these areas can be found in the recreation appendix.

4.19 The most significant recreation resource in the study area is the Portage Canal and lock structure. This resource has been previously described under cultural resources.

4.20 Immediately north of the State Highway 33 bridge, the existing levee passes through and terminates in Pauquette Park. The levee divides the park into two sections; the landward side is dominated by an irregularly shaped pond with a small footbridge spanning a narrow area, while the riverward side contains playground equipment, a picnic area with shelter, a paved basketball court, and an informal ball field. Land and Water Conservation (LAWCON) funds were used to provide lighting and a basketball court in the park.

4.21 There is a public boat landing near Sunset Park at the intersections of West Carroll and Conant Streets and Summit Street. This facility is the only Wisconsin River access site in the city of Portage.

4.22 Riverside Park is located on a small tract of land bounded by U.S. Highway 51 and 16, the existing Portage levee and Dodge Street, immediately east of the city's central business district, and the Portage Canal. This park provides both off-street parking and picnicking facilities. The top of the existing levee, in the Riverside Park area, is currently used as a walkway. A small path runs north toward the

Portage Canal and lock structure and south along the highway. A few benches have been provided along this walkway for resting or viewing the Wisconsin River floodplain.

Social Resources

4.23 Significant social resources include: the Portage Canal, community development, and social cohesion. The Portage Canal is described in detail in the cultural resources appendix. Community development is of significant local concern. Housing redevelopment is currently underway, with funds provided through a HUD Community Development Block Grant. Seventy percent of these funds are earmarked for Ward 1. This is the older portion of the city and it contains the highest percent of deteriorated housing and low/moderate income households.

4.24 Community officials also believe that the restrictions placed by the floodplain regulations have slowed redevelopment in the community. However, the recent "no growth" trend in the community more likely results from two other factors. First, decline in agricultural employment in the area has reduced the community's role as a service center. Also, increasing transportation costs have lessened but not eliminated the community's attractiveness as a bedroom community for the Madison metropolitan area. Therefore, significant future community growth depends on the ability to attract new sources of employment. Reduction of flood threat and subsequent removal of the floodplain ordinance may help in this redevelopment effort.

4.25 Social cohesion in the Portage area is, to some extent, determined by the relations between three distinct groups: city residents, township residents, and recreation-home owners. All three groups historically have been subject to flooding. The series of levee segments now in place is an indicator of each area's attempt to resolve its flood problems independently. Each of these groups is concerned that any flood

solutions employed by the other groups not adversely affect its area. A more detailed description of the social system of the Portage area is presented in the social and economic appendix.

5.00 ENVIRONMENTAL EFFECTS

SIGNIFICANT IMPACTS

5.01 This section discusses the environmental effects of each alternative on the significant resources described in the preceding section. For additional information, see the comparative impacts and compliance tables in this document and the feasibility report.

Floodplain Forests

5.02 The structural alternatives, improvement of the Portage levee and refinement to the Portage levee alignment, would both directly impact some of the floodplain forest areas surrounding Portage. The nonstructural alternative is the only alternative that would not impact this habitat type. Each alternative would affect approximately 72.2 and 41.2 acres, respectively. The approximate 0.2 acre located adjacent to Summit Street in Ward 8 would be impacted by both alternatives. Although the trees and understory vegetation would be removed as a result of construction activities, the loss of this habitat in comparison to the remaining forested area is not considered to be significant. Hence, no mitigation or other forms of compensation would be required.

5.03 Southeast of Ontario Street and bounded by U.S. Highway 51 and 16 and the Wisconsin River are 190 acres of bottomland floodplain forest. This area is considered well-developed and highly productive in relation to the kinds of wildlife present. Improving the existing levee or constructing a new levee in this area would result in an adverse impact on this floodplain habitat. The levee improvement alternative would

directly affect 72 acres while the levee refinement alternative would impact only 41 acres. With improvement of the existing levee, a 95-acre tract of land would remain landward of the levee. This area could eventually be developed as residential or commercial properties since it would essentially be considered outside the floodplain with the levee in place. Refining the levee alignment would leave a 145-acre tract of land riverward of the levee. This land would remain in the floodplain of the Wisconsin River and therefore would not be developable. The levee improvement alternatives would require acquisition of approximately 95 acres for compensation and to ensure its continued existence as a forested area, while the refinement alternative would help retain the river-floodplain forest corridor. Under either alternative, it is recommended that the levee and berm be seeded with a mixture of native grass species. This grassy area should not be mowed until August of each year to provide nesting and rearing cover for wildlife populations such as songbirds, waterfowl, and small mammals.

Wetlands

5.04 Improvement of the Portage levee and refinement to the Portage levee alignment would directly impact approximately 9 and 11 acres, respectively, of an emergent wetland area downriver from Portage. The nonstructural alternatives would have no effect on this wetland area. The wetland lies at the downriver end of the project adjacent to U.S. Highway 51 and 16. The levee improvement alternative would leave approximately 31 acres of the wetland area inside the levee, while approximately 29 acres, with the refinement alternative alignment, would remain outside the protection of the levee. Although both alternatives would, for all practical purposes, adversely impact this wetland area and its corresponding wildlife community, the refinement alternative alignment would provide protection for the remaining acreage whereas the improvement alternative could cause its ultimate loss through residential or commercial development. To prevent such development, the purchase of

the remaining 41 acres would be required as compensation with the latter alternative. As previously discussed under floodplain forests, the levee which crosses the wetland area (i.e., refinement to the Portage levee alignment) would be seeded with native grass species for wildlife purposes. Mowing would also be prevented before August of each growing season. In addition, if the residential property located immediately south of this wetland area is required to be relocated, it is recommended that the area be excavated down to the level of the existing wetland and seeded with emergent wetland plant species. This action would enhance the existing wetland area and help offset the 11 acres lost with levee construction.

Wisconsin River

5.05 The improvement of the Portage levee and refinement to the Portage levee alignment alternatives would similarly affect approximately 11 acres of the riverine environment of the Wisconsin River. The affected environment is a shallow backwater area which parallels the main channel from the State Highway 33 bridge downriver to Ontario Street. The impacts would result from widening the existing levees riverward a distance of 50 to 120 feet. The overall effects of placing sand and riprap material on the existing sand levees, riverine substrate, and current patterns (see paragraph II.B.2. on page 7 of the 404(b)(1) evaluation), through the construction of either alternative would not be significant and would therefore not require compensatory measures. This determination is due in part to the fact that the construction material would not introduce any harmful constituents that would change or add to the chemical composition of the aquatic environment in the river or the downstream reservoir. In addition, the backwater area in which the material would be placed is often subject to rather rapid fluctuations in both water levels and current velocities which results in the continuous appearance of large sandbars. This movement of large quantities of sand has resulted in the development of an area of the river that is practically void of both aquatic plant and animal populations. Fish

probably migrate through the area during high flow periods, but it does not provide a suitable environment for their many life requisites (i.e., spawning, feeding, cover, and nursery areas).

5.06 An estimated 500,000 cubic yards of sand material would be needed for the construction of the Portage levees. Some existing upland sites (quarries) that would provide this material have already been identified (see paragraph 3.19). However, all or a portion of the material could also be obtained from the above identified backwater area of the Wisconsin River. Although it has not been determined that the river sand would be suitable for this purpose, a number of potential impacts on the aquatic environment are foreseen. If the material is removed from the river during normal river stages, an increase in suspended particulates could occur, resulting in an adverse impact on downriver environments and their associated aquatic communities. Also, the removal of such a large quantity of material would undoubtedly create a large depression in this backwater area. Although the depression would probably refill, the resulting effects on the aquatic resources are not known at this time, and further study would be needed if the borrow material were to be obtained from this area.

Wildlife Management Areas

5.07 As previously identified, the 1,320-acre Swan Lake and the 4,500-acre Pine Island State Wildlife Areas are the only wildlife management areas in the vicinity of the study area. Although the extreme southern boundary of the Swan Lake Wildlife Area lies within a few hundred feet of the refinement alternative alignment, neither this alternative nor the other alternative alignment is expected to negatively affect these areas. Hence, no compensation would be required.

Natural Resource Areas

5.08 The Leopold Memorial Reserve and the sandhill crane habitat area would not be affected by any of the alternatives currently under consideration for flood control at Portage.

Threatened and Endangered Species

5.09 Although locations for reintroduction of the peregrine falcon have been identified along the Wisconsin River, this species is still considered to be principally a migrant and it does not nest within the study area. None of the proposed alternatives would, therefore, have a significant adverse effect on this species. Of the three State threatened species (i.e., red-shouldered hawk, speckled chub, and black buffalo) known to occur in the Portage area, none would be adversely affected by any of the proposed alternatives. The selected plan could provide some benefits to the red-shouldered hawk by protecting the floodplain forest along the Wisconsin River at the downriver end of the project.

Construction Impacts

5.10 Construction of the selected alternative could have localized effects on the natural and human environments found within the project area. These effects would include, but are not limited to, an increase in traffic volume, noise levels, air pollution, soil erosion, and water quality problems. The following paragraphs discuss these effects and suggest methods that would be employed to minimize them, where applicable.

5.11 Transporting an estimated 500,000 cubic yards of fill material to the construction area would result in an unavoidable adverse impact on existing travel corridors within the Portage area. In an effort to minimize this potential impact as much as practicable, the number of

potential borrow areas, their distance to the construction area, and the number of travel corridors would be kept to a minimum. In addition, construction of each levee segment would be coordinated with each borrow site so as to permit a constant and continuous movement of material through the construction period. This could potentially reduce the overall time frame in which each travel corridor would be impacted by construction activities. As currently planned (see paragraph 3.12) the estimated quantity of fill material would be obtained from existing upland quarries within 2 miles of each construction segment. The principal travel corridors would include U.S. Highway 51 and 16, State Highway 33, and County Highway 0. Roughly three-fourths (or 386,000 cubic yards) of the fill material would be hauled in on U.S. Highway 51 and 16 for levee segment e. The overall impacts along this corridor are not expected to be significant since this highway currently exists as a principal truck route into Portage and the land surrounding the roadway consists of open marshland, farmland, and industrial complexes. The remaining material, approximately 80,000 and 34,000 cubic yards, would be hauled into levee segments a, b and c on State Highway 33 and County Road 0. Both of these travel corridors would require some movement into residential areas. Although only one-fourth of the total material would be hauled into these areas, they are subject to a greater degree of impact merely because residential areas are more sensitive to increased traffic levels. To help reduce impacts on such sensitive areas, work related restrictions such as weight limits, working periods (i.e., daylight periods only), loads per day, etc., could be employed during the construction period. In any event, local residents would be notified prior to the initiation of construction activities.

5.11a On the average, the noise levels in Portage generally range from 42 to 63 decibels, which exceeds the U.S. Environmental Protection Agency guidelines by 8 decibels. Project related noise would result from operation of bulldozers, backhoes, graders, trucks, etc., and would vary

depending on the location at which construction would occur. Levee construction upriver from the Portage Canal would probably exceed Environmental Protection Agency guidelines because the levee extends into residential and other noise-sensitive land use areas. The levee downriver of the canal parallels a commercial and industrialized area which normally receives higher sound levels. In order to reduce the overall effects of sound in Portage, the construction process would be segmented so that work would occur in only one location at any one time and work would be prohibited during evening and nighttime hours.

5.12 Ambient air quality is fairly good with only suspended particulates (i.e., dust, soot, etc.) and photo-chemical oxidants or ozone (O_3) posing a potential problem. Air quality would not be significantly affected by the proposed flood control project. Increased levels of dust (particulates) may occur as a result of clearing, grading, and leveling the existing levees, and excavating, loading, transporting, and unloading fill material. The projected impacts are expected to be minor, short-term, and limited to construction areas. Exhaust emissions of CO, HC, nitrogen oxides (NO_x), sulfur oxides (SO_x), and particulate matter would be associated with the increased vehicular traffic as well as the use of mobile internal combustion engines. The impacts that would result from these sources would be minimal and well within Federal guidelines for such emissions.

5.13 The existing levees and immediate shoreline in the project area are predominantly sand - silty sand. During past high water periods, the existing levees experienced extensive surface sloughing indicating the highly erodible nature of this sand substrate. The removal of surface soils during construction could expose this material to the erosive actions of rain and flowing water during high river stages. However, construction activities would generally be undertaken during normal and low river stages when large sand flats develop along the main and side channels and backwater areas. Also, these activities would be segmented

so that only one section of the existing levee or shoreline would be exposed at any one time. Once constructed, the new levees would be protected from future erosion activities through the placement of riprap on the riverward side in high energy areas and grass plantings in all other areas.

5.14 As stated in paragraphs 4.04 and 4.12, the overall water quality of the Wisconsin River tends to be very good. In paragraph I.D.2., of the 404(b)(1) evaluation, it is stated that the bottom sediments of the Wisconsin River and side channel area in Portage are relatively uncontaminated with both PCB's and heavy metals occurring below established detection limits. Since current plans call for obtaining levee borrow material from the side channel area and construction would generally occur when this area and other backwater areas are in a relatively dry state, construction of the levee system would not seriously degrade existing water quality in the Wisconsin River. In order to avoid contamination of the aquatic environment from petroleum-based products such as gasoline and diesel fuels, oil, and grease, all construction equipment would be refueled, maintained, and stored outside the construction area. The exact location of such an area will be identified during later stages of the planning process.

CULTURAL RESOURCES IMPACTS

Portage Canal

5.15 One initial design considered at the Wisconsin River Lock (improvement and refinement alternatives) included a levee across the mouth of the canal. This design was eliminated from further consideration because of the adverse impacts to the National Register property. During the scoping process, a large number of negative responses were received to all designs which foreclosed options for future reuse of the canal. Economic analysis of the levee closure design and a design to incorporate the lock structure into the floodwall design show that both are comparable in cost (see the main report).

5.16 Currently, design of the canal closure at the Wisconsin River Lock is based on a system of floodwall, lock gates, and levee. The Portage levee in Ward 1 ties into the canal at the upstream gate of the lock. A concrete wing wall acts as an interface between the levee and the lock structure. On the other side of the lock, a floodwall ties into the top of the structure. The elevation at the top of the floodwall and levee is 798.7, while the elevation at the top of the gates is 796.0. Closure of this 2.7-foot difference would be accomplished with sandbags and plywood placed between the gate and the handrail. This closure would be made only during floods.

5.17 Work at the lock would include replacement of the upper set of existing gates. The gates on the upstream end of the lock would be approximately 7.0 feet shorter than the existing gates because of the construction of a concrete sill across the mouth of the lock. This sill provides stability to the floodwall and prevents the lock gates from silting in. The new gates would be bolted shut and no opening mechanism would be provided for in the present design. However, the bearings and struts to the gates would be replaced so that the gates could be made operable at a future date. A 5-foot draft would be maintained between the normal water surface in the lock and the top of the concrete sill. This draft would be ample for small-craft navigation if the lock were to be opened.

5.18 A number of other measures would be taken to maintain the historic character of the lock. The new gates would be horizontally framed out and be rivet-bolted so they would have the appearance of the existing riveted gates. If possible, the lifting mechanisms for the filling gates would be salvaged from the old gates; however, new gate handrails would replace the old handrails. Also, the concrete in the floodwall could be tinted and streaked to match the existing appearance of the lock. The recommended alternative should have a beneficial effect on the Portage Canal since the gates of the present structure are deteriorated. See Memorandum of Agreement in Attachment 1 of this document or in appendix G.

Wauona Trail

5.19 Both of the improvement and refinement alternatives would have only a minimal impact on the Wauona Trail as it exists today. Currently, the trail is an asphalt paved city street running between Wisconsin Street and State Highway 33. The existing Portage levee now crosses the trail at the Wisconsin River. Both alternatives would replace the existing levee with a new levee. The new levee at Wauona Trail would be approximately 2 feet higher than the old levee and it would be located more riverward than the existing levee.

5.20 The nonstructural alternative, evacuation of Ward 1, may have a beneficial effect on the Wauona Trail because it would require removal of the more recent structures which have been constructed adjacent to the trail.

Zona Gale House

5.21 The nonstructural alternative would have no effect on the Zona Gale House. Improvement of the Portage levee and refinement to the Portage levee alignment could have a visual impact on this National Register property from construction of the floodwall. This property sits at approximately elevation 805. The floodwall would be constructed along the 790-foot contour with the top of the floodwall at elevation 798.7. The floodwall would probably be backfilled for a portion or all of the 8.7-foot height. If the floodwall were visible from the property, landscaping along the wall could retain the properly landscaped appearance with which Zona Gale was concerned when the house was constructed (see footnote 2 of the National Register nomination form in the cultural resources appendix). This feature is provided for in the Memorandum of Agreement in Attachment 1 or appendix G.

Aldo Leopold Shack

5.22 This property was originally considered in the Stage 2 Alternatives Report because of a potential for increased frequency and duration of flooding of the site as a result of construction of the Portage, Lewiston, and Caledonia levees. Further analysis of this site in relation to the improvement, refinement, and nonstructural alternatives shows that none of these alternatives would impact on this National Register property. The site is located on a small sand rise which is above the 100-year floodplain.

Nonassessed Cultural Resources

5.23 This section discusses those resources which have not been assessed against the criteria of the National Register of Historic Places but which may be potentially eligible. Also discussed is the potential for impacting undiscovered archeological resources which could qualify for the National Register (see the Memorandum of Agreement in Attachment 1 or appendix G).

5.24 No known archeological resources would be impacted by any of the alternatives. The area with the highest potential for presently undiscovered archeological remains is located at the ends of levees where the land rises above the floodplain. Construction of levees could physically damage any sites in these areas. Archeological sites could also be damaged by borrow areas, berm areas, relief wells, road closures, and areas established for interior drainage (see Future Studies Required, cultural resources appendix).

5.25 On the basis of a reconnaissance survey conducted in 1981 by Joyce McKay, no areas of historic resources recommended for further study would be impacted by either structural alternative. This is primarily because the new levee location would be riverward of the existing levee. Both structural alternatives may require the relocation of the Tollgate House.

This gate house was built in 1851 as part of the plank road which crossed the lowlands east of Portage. The structure is presently being restored by the Columbia County Historical Society which moved it to its present location.

5.26 The nonstructural alternative would have the greatest impact on nonassessed cultural resources. This alternative would require removal of structures from the Ward 1 area. Within the Ward 1 area, 88 structures exist which date to the century between the 1830's and 1930's. The bulk of these structures date to the 1850's (28) and the 1870's (25) with 1 to 10 structures dating to other decades. These structures are both residences and businesses within Ward 1.

RECREATION RESOURCES

5.27 The structural alternatives, improvement of the Portage levee and refinement to the Portage levee alignment, would directly affect the five recreation resource areas in Portage (i.e., Portage Canal, Pauquette Park, Riverside Park, boat ramp, and levee top path) while the nonstructural plan would have no impact. As previously identified, both structural alternatives would require crossing the Portage Canal at its lock structure on the Wisconsin River. Incorporating this structure into the levee designs would include replacement of the riverward lock gates and an extension of the left wing wall approximately 550 feet upriver. In raising the levee in Pauquette Park, some of the light fixtures and playground equipment would need to be relocated. The Summit Street road raise would render the existing boat ramp near Sunset Park unusable; however, a new access road and boat launching facility would be incorporated into the road raise design. This would offset the initial adverse effect on this recreation facility. Raising and widening the existing levee in Riverside Park could affect this area depending on whether the levee is widened mostly riverward or landward. If the levee is widened mostly landward, it would encroach on some of the park facilities. To compensate for this action, the landward side of the

Levee would be designed to have a more gradual slope so that the area would be used by park visitors. Also, the existing walkway on top of the levee, at this location, would be lost through levee reconstruction. The new levee design could be developed in such a way as to incorporate a new walkway.

Social Effects

5.28 The physical effects on the Portage levee from each alternative are discussed in the cultural resources section. Apart from the canal's importance as a historic structure, its perceived local value is extremely high. Preservation and enhancement provided by the selected plan would also benefit local cohesion and community identification. Designs which ignore, or adversely affect, the canal would result in local controversy and polarization of community groups.

5.29 Community development would benefit from the selected plan. Flood protection would remove an impediment to redevelopment. The nonstructural plan would have a similar consequence and would also remove much of the deteriorated areas. However, in view of the current economic conditions in the community, relocatees might choose to redevelop in other areas of the region. Portage's economy is not currently strong enough to withstand a significant out-migration of residents and businesses. The no action plan would have no impact in this area.

5.30 The effects of the selected plan on social cohesion would vary between groups. Cohesion among Portage residents would increase from removal of the flood threat and support for redevelopment. Cohesion between Portage, Caledonia, and Lewiston groups may decrease, however, since Caledonia and Lewiston residents oppose flood control solutions which do not benefit them. The nonstructural plan would adversely affect social cohesion in Portage. Because of the potential community development consequences, this plan is unacceptable. Portage residents prefer an alternative which supports redevelopment rather than

abandonment of the Ward 1 area. Residents of Lewiston and Caledonia Townships would not be affected by this plan so intergroup cohesion would not be affected. Therefore, the nonstructural plan, while resolving flood problems in Ward 1, has no basis of local support.

5.31 The last alternative considered was no action. This was the preferred alternative outside the city of Portage and the town of Pacific. When faced with the cost and community disruption caused by improving only some segments of the existing levees, most leaders felt that the existing levees afforded sufficient protection. In addition, since the levees have not been breached since 1938, there is a widespread feeling that they are adequate. The one shortcoming frequently noted is that floodplain lands will be restricted for future development as long as less than 100-year protection is offered. Even so, outside of the city and one town, this is the alternative preferred.

5.32 The final issue of social effect involves impediments to implementation of the selected plan; namely, local opposition. Local opposition from the south side of the river is greatest with the levee alternative since the residents and leaders believe (despite information to the contrary) that this alternative would undoubtedly raise flood levels on the south side of the river.

6.00 PUBLIC INVOLVEMENT

PUBLIC INVOLVEMENT PROGRAM

6.01 A Notice of Intent to Prepare a Draft Environmental Impact Statement for a Proposed Flood Control Project, Wisconsin River at Portage, Wisconsin, appeared in the Federal Register on 22 April 1981. This notice invited participation in the scoping process by anyone who was interested.

6.02 As part of the study and scoping process, the views of the public were actively solicited throughout the study. Individuals, groups, civic organizations, and government bodies were brought into the study process through a broad-based public information program with regular communication on project matters. In addition, a citizens committee was formed in May 1977. The committee met periodically to hear and discuss presentations on the water resource development plans and issues in the study area. These meetings were open to the public. In January 1981, the Stage 2 Alternatives Report was distributed to the public for review and comment. Throughout the study, coordination has been maintained between the St. Paul District and Federal, State, and local government agencies and interested groups, agencies, and citizens. A detailed discussion of the public involvement program is presented in appendix J.

REQUIRED COORDINATION

6.03 Following coordination of the Draft EIS with appropriate agencies, groups, and individuals, a meeting with the city council was held. Comments received at the meeting or by letter concerning the Draft Feasibility Report and EIS were used in preparation of the final feasibility report and EIS. Coordination with appropriate agencies and groups continued throughout the study process.

6.04 Coordination with the Fish and Wildlife Service has been maintained throughout the study (see Attachment 1-23 and Appendix J). This coordination effort resulted in the evaluation of several FWS recommendations during the planning process. These recommendations, including those portions of the text in which they are discussed, include a ring levee around Ward 1 (see paragraph 3.03); effects on the Leopold Memorial Reserve (see paragraphs 4.15, 5.08, and 5.21); effects on the wetland and floodplain forested areas adjacent to U.S. Highway 51 and 16, the creation of additional wetland acreages to mitigate losses, and the mowing of levee grasses (see paragraphs 5.03 and 5.04); an evaluation of 1V on 1H side slopes to avoid excessive filling of the Wisconsin River floodplain (see paragraph 3.18); locating borrow sites in upland areas and avoiding environmentally sensitive areas (see paragraphs 3.19 and 5.11); and restoring wetlands that might be unavoidably filled during construction activities.

6.05 Further coordination is required with the Fish and Wildlife Service and other agencies concerning the potential need for compensation and the effects of obtaining borrow material from the Wisconsin River if such material is determined to be suitable for levee construction.

6.06 In accordance with Section 7(c) of the Endangered Species Act of 1973, as amended, the Final EIS contains a determination of the biological assessment of impacts on federally-listed or proposed threatened or endangered species which may be affected by the project.

6.07 This EIS was coordinated with the Wisconsin State Archeologist, the State Historic Preservation Officer, the National Park Service, and the Advisory Council on Historic Preservation. Continued coordination with Federal, State, and local agencies will be necessary to ensure that a socially and environmentally acceptable plan is implemented.

6.08 Because the proposed plan involves placement of fill material in waters of the United States, a Section 404(b)(1) Evaluation of the effects of the fill placement was prepared and circulated with the draft documents in compliance with the Clean Water Act of 1977, as amended (Public Law 92-500). The feasibility report and Final EIS, containing the Section 404(b)(1) Evaluation, will be submitted to Congress pursuant to Section 404(r) of the Clean Water Act.

FINAL EIS DISTRIBUTION

6.09 The following agencies, organizations, and individuals will be sent copies of this Final EIS. Those identified with an asterisk (*) provided comments on the Draft report. Their comment letters along with the Corps responses, where applicable, are presented in Attachment 1.

Federal Agencies

United States Department of Agriculture

Soil Conservation Service*

Forest Service

United States Department of Commerce

Economic Development Administration
National Weather Service
Federal Power Commission
National Oceanic and Atmospheric Administration*

United States Department of the Interior

Office of the Secretary
Bureau of Indian Affairs
Bureau of Land Management
Fish and Wildlife Service*
Office of Environmental Project Review*

United States Department of Housing and Urban Development*

Federal Housing Administration
Federal Emergency Management Agency*

United States Department of Transportation

Regional Representative to the Secretary of Transportation
Federal Highway Administration*
Second Coast Guard District

U.S. Environmental Protection Agency*

United States Department of Health and Human Services

Public Health Service*

Advisory Council on Historic Preservation*

Governor of Wisconsin

Honorable Anthony S. Earl

Wisconsin State Agencies

Department of Administration
Department of Agriculture
Division of Emergency Government
Department of Health and Social Services
State Planning Office
State Board of Health
Department of Natural Resources*
Natural Resources Council of State Agencies
Department of Transportation*
Public Service Commission
Board of Soil and Water Conservation Districts
West Central Wisconsin Regional Planning Commission
North Central Wisconsin Regional Planning Commission
Southwestern Wisconsin Regional Planning Commission
State Historic Preservation Officer*

Legislative Representatives

State Senator
State Assemblyman

County and Local Agencies

Columbia County Clerk
Columbia County Treasurer
Sauk County Clerk
Sauk County Treasurer
Sauk County Highway Commissioner
Committee for Sensible Zoning
Mayor of Baraboo
Chairman, Town of Fairfield
City of Portage*

Interest Groups and Individuals

American Waterways Operators
Coalition of American Rivers
Izaak Walton League of America
Northern Environmental Council
River and Harbor Improvement Association
Sierra Club
Portage Citizens Canal Committee*
Portage Chamber of Commerce
Water Resources Literature Clearinghouse, University of Wisconsin
- Green Bay
Wisconsin Canoe Association
Mr. Frank Kacizak, Poynette, Wisconsin
Mr. Sebastian Kacizak, Poynette, Wisconsin
Mr. W.J. Dietz, Portage
Captain Douglas H. Madigan, Sun Prairie, Wisconsin

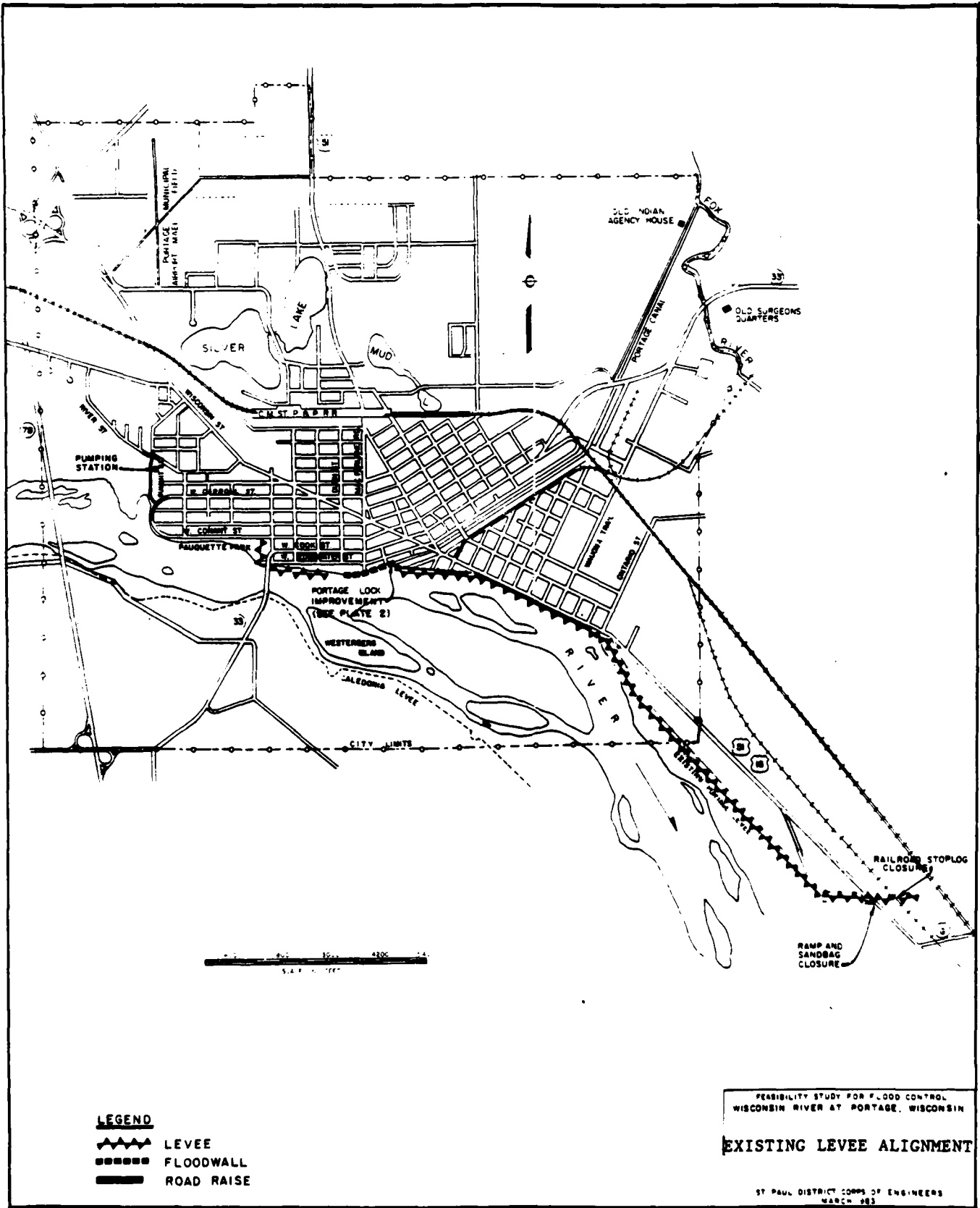
PUBLIC VIEWS AND RESPONSES

6.10 Public views on natural resources have been solicited at public meetings and through the scoping process. Responses stressed concern over alternatives which would foreclose future options to reuse the Portage Canal. Public concern over impacts to this National Register property and overall economics resulted in the incorporation of the lock structure into the flood control project.

LIST OF PREPARERS

The following people were primarily responsible for preparing this Environmental Impact Statement:

<u>Name</u>	<u>Discipline/ Expertise</u>	<u>Experience</u>	<u>Role in Pre- paring EIS</u>
Mr. John Anfinson	Historian	1 year, EIS studies with Corps of Engineers, St. Paul	Effects on Historic Resources, Formulation of Historic Preservation Design at Portage Canal
Mr. David Berwick	Archeologist	4 years, State Historical Society of Wisconsin, 5 years, EIS studies with Corps of Engineers, St. Paul and Memphis	Effects on Archeological and Historic Resources
Mr. Robbin Blackman	Supervisory Biologist	13 years, EIS studies, Corps of Engineers	EIS Coordinator
Mr. Michael O'Keefe	Wildlife Biologist	5 1/2 years EIS studies, Corps of Engineers St. Paul	EIS coordinator, Biological Evaluation, prepared EIS
Mr. Franklin E. Star	Outdoor Recreation Planner	1 year, Minnesota Department of Natural Resources, Staff of Citizens Advisory Committee for Trail Planning, 7 years, Corps of Engineers, St. Paul	Recreation planning and evaluation
Mr. David Miller	Supervisory Sociologist	6 years, Corps of Engineers	Social analysis



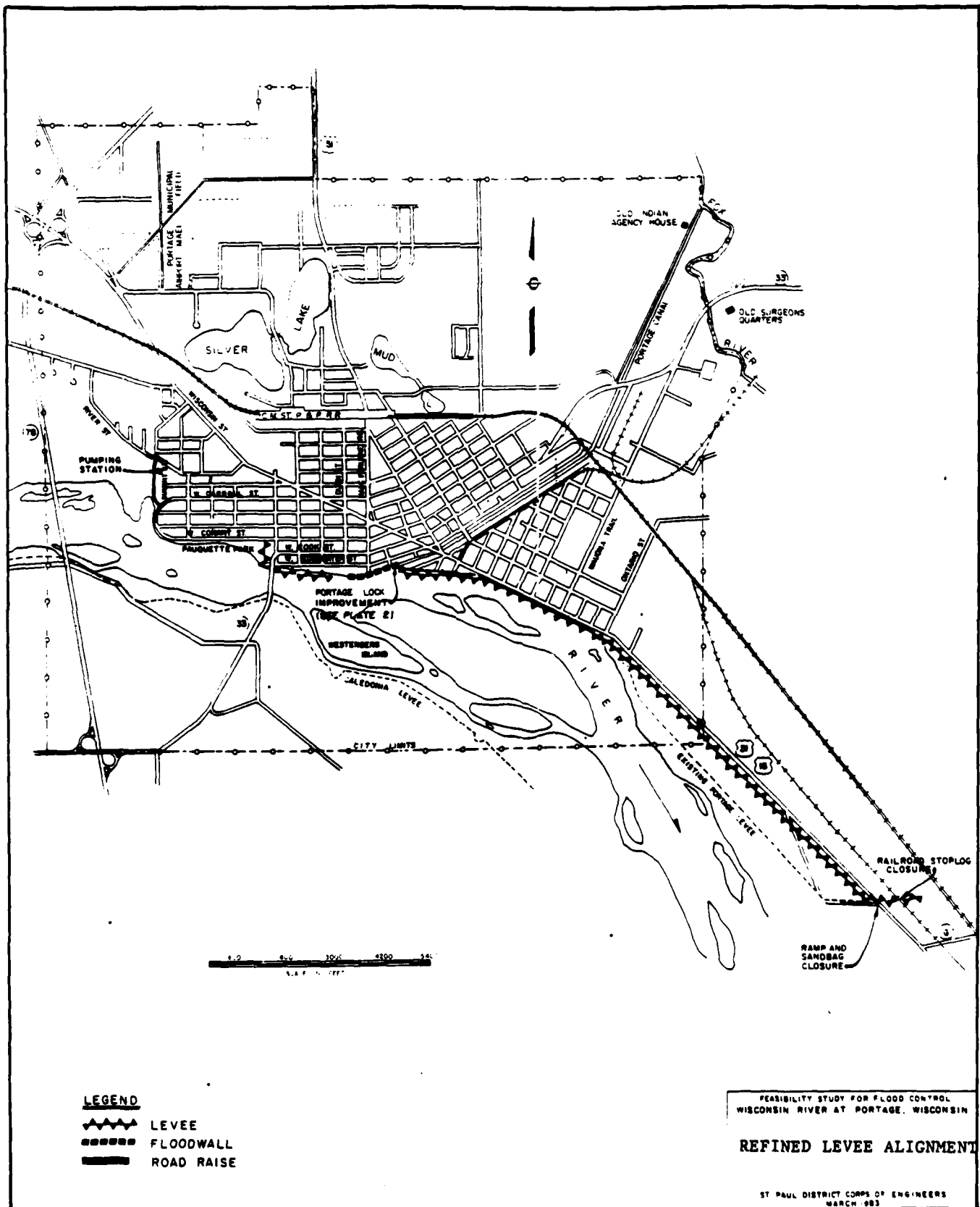


Figure 2

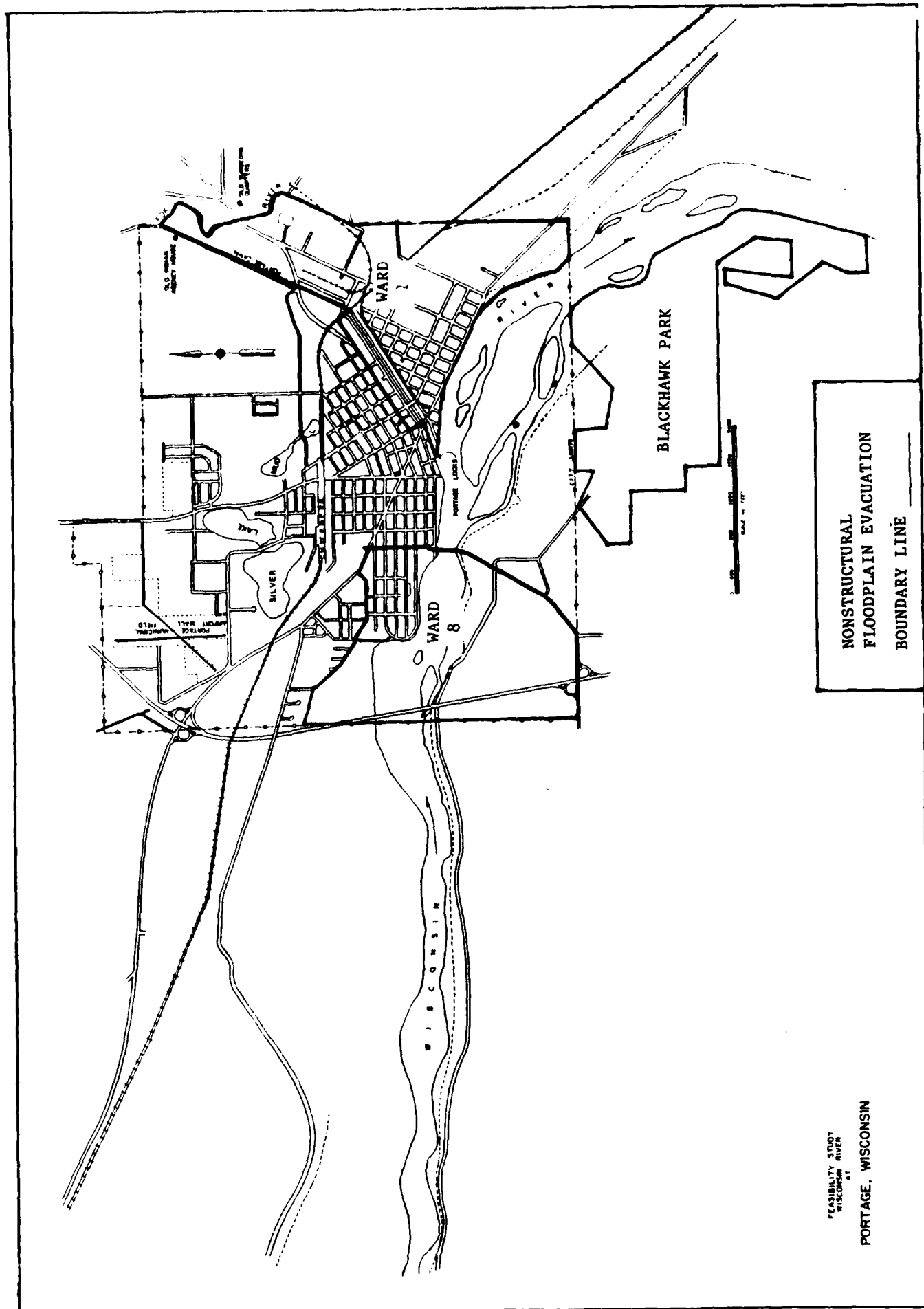


Figure 3

SECTION 404(b)(1) EVALUATION
FOR FILL ACTIVITIES ASSOCIATED WITH THE FLOOD
CONTROL PROJECT ON THE WISCONSIN RIVER AT PORTAGE, WISCONSIN

I. Project Description

A. Location: The proposed fill activity would take place along the Wisconsin River in the immediate vicinity of Portage, Wisconsin.

B. General Description: The proposed fill activity is part of the levee construction around the city of Portage to protect against the 500-year flood. Three distinct sections would be involved in the levee construction. Section (1) Ward 8 area - 1,300 feet of road raise up to 5 feet high and 107 feet wide would be constructed on the western edge of the city of Portage. Section (2) - 8,400 feet of levee (of which 550 feet would be concrete wall adjacent to and upstream of the Portage Lock structure) would be constructed from the Highway 33 bridge (not a continuous levee) downstream to Ontario Street in the city of Portage. The levee would be constructed to a height of about 5 feet over the existing levee and/or ground with a maximum width of 120 feet. Section (3) - 7,700 feet of levee and berm would be constructed along U.S. Highway 51 and 16 from Ontario Street to the end of the project near County Road G. The levee and berm would be constructed to a maximum height of 12 feet and a width of 250 feet.

C. Authority and Purpose: The purpose of the project is to provide flood protection for floods up to and including the 500-year flood for the city of Portage, Wisconsin. Authority for the project is derived from the resolution of the House Committee on Public Works adopted 14 June 1972 and contained in House Document 259 of the 71st Congress, second session.

D. General Description of Dredged or Fill Material:

1. General Characteristics and Source of Fill Material: Fill material would consist of approximately 8- to 9-inch diameter locally quarried rocks for riprap, stabilized aggregate for road subsurface, and material removed from the side channel area of the Wisconsin River immediately adjacent to and downstream of the city of Portage, if the material is determined to be suitable, for levee construction. The exact nature of the material is unknown but, based on visual inspection and knowledge gained from the geotechnical investigations undertaken for the levee design, the material would be predominantly sand with very little, if any, silt or clay material. If this material is determined to be unsuitable for levee construction, sand fill material would be obtained from existing approved local borrow pits. In areas of the levee system that would not be stabilized by rock riprap, a cap of finer soil would be placed over sand fill material and planted with grass. In addition, a 550-foot long concrete wall would be placed in the area immediately upstream of the entrance to the Portage Canal.

2. Chemical Characteristics of Fill Material: In 1978, the Environmental Protection Agency collected and analyzed sedimentation samples from the main channel of the Wisconsin River, immediately upstream and downstream of the city of Portage, as part of the EIS for the new Portage Sewage Treatment Facility. Their data indicate that the bottom sediments in this area are relatively uncontaminated. Polychlorinated biphenyls (PCB's) were not found above the detection limits of 0.05 ug/g. The selected toxic heavy metals analyzed were all in relatively low concentrations. Although the samples were not collected from the side channel area which could potentially be used as the fill source, the proposed fill material is undoubtedly of similar characteristics. Since existing sediment quality data in the general area include the presence of relatively coarse uncontaminated sediments, the proposed fill material from the side channel would be excluded from further testing as provided by 40 CFR 230.60. If this material is

determined to be unsuitable for levee construction, the fill material would then be obtained from a locally approved borrow pit that has been shown to have relatively uncontaminated coarse soil. This material would also be excluded from further testing by 40 CFR 230.60.

3. Quantity of Fill Material: For section 1 of the levee system, 3,400 cubic yards of sand fill material would be placed and capped with 733 cubic yards of stabilized aggregate and 26,400 square yards of bituminous surfacing for the road area with a minor amount of soil from the general area on the remainder of the levee surfaces. Section 2 of the levee system would require 169,000 cubic yards of sand fill and 30,810 cubic yards of quarried rock, placed in a layer 12 inches deep. Section 3 of the levee system would require 158,400 cubic yards of sandfill for the levee and 146,400 cubic yards for the berm, both of which would be capped with a minor amount of soil from the general area.

E. Description of Proposed Fill Sites: Section 1 of the proposed levee system is located along the southwestern edge of the city of Portage (map 1). Most of the fill material would be placed on the existing road to raise it. However, along 1,300 feet of the existing roadway, material would be placed approximately 20 feet into the bottomland hardwood forest located immediately west of the existing levee. This would involve some tree removal and burial of approximately 0.24 acre of bottomland hardwood wetlands. Standing water in this area occurs only during periods of high river discharge, and construction would not occur during these times. Therefore, the fill material should not come in contact with open water prior to vegetative stabilization.

Section 2 of the proposed levee system is located along the southern boundary of Portage next to the main channel and a side channel of the Wisconsin River and extends from the Highway 33 bridge downstream and almost continuous to Ontario Street in Portage (map 1). For the approximately 2,000-foot upstream portion of this section of the levee system, from the Highway 33 bridge to about Dunn Street, the levee would

extend a maximum of 120 feet into the main channel of the Wisconsin River. Approximately 6.6 acres of stream aquatic habitat would be covered. The bottom substrate in this area likely consists of a coarse sand material and, as a result, it is anticipated that benthic productivity is low and species diversity is probably dominated by tubificid worms and chironomid midges. No aquatic macrophytes are present along this site. The existing levee in this area is vegetated by grasses, shrubs, and a limited number of trees. This resource would be removed. The fill activity of this site would be uncontained, riverine placement.

The remainder of this section of the levee system, from the Portage Canal downriver to Ontario Street, would be constructed along a side channel of the Wisconsin River. Most of the fill would be placed on the existing levee system. However, some fill would be placed on the average of 50 feet into the side channel area. This would result in the filling of approximately 4.1 acres of stream aquatic habitat. Much of this side channel area is subjected to frequent and prolonged drying out periods, under low-flow regimes on the Wisconsin River. Therefore, the benthic fauna of this area is extremely limited and fish utilization is limited to periods of higher flow. As with the upstream portion of this section of the levee, the existing levee is vegetated by grasses, shrubs, and a limited number of trees, all of which would be removed.

Much of this area, for at least a portion of the construction season would have no standing water present and, therefore, the sand fill would not be exposed to water prior to stabilization with rock. In those areas which do have standing water, the fill activity would take place in an unconfined riverine setting.

Section 3 of the proposed levee system is located east of the city of Portage and extends southeast from Ontario Street along U.S. Highway 51 and 16 for a distance of 7,700 feet to County Road G. The levee would then cross U.S. Highway 51 and 16 and continue north for approximately

200 feet before tying into higher ground (map 1). This section of the levee system would be about 75 feet wide with a 175-foot-wide berm for a maximum total width of 250 feet. Preliminary geotechnical investigations of this area indicate that the soils form a water impermeable layer. The 175-foot berm would be required to prevent seepage and ensure stability of the levee. A more detailed soils investigation would be conducted before actual construction of the levee and berm which may reduce or even eliminate the berm portion of the system, thus minimizing environmental impacts and reducing costs. However, for the purpose of this 404(b)(1) evaluation, a maximum width of 250 feet was used to evaluate the impacts.

Section 3 of the levee system would involve placement of fill and destruction of 41.2 acres of floodplain forest and 11 acres of emergent wetlands. The area that would be impacted is part of an area that has been cut off from the rest of the wetlands along the Wisconsin River by an existing levee. This area within the levee consists of 95 acres of bottomland hardwoods, 40 acres of emergent wetlands, and 8 acres of filled and developed land. The bottomland hardwood area is dominated by elm, cottonwood, maple, river birch, and ash, and appears to be a typical climax bottomland hardwood wetland. Interspersed in the bottomland hardwoods are occasional small pockets of open water and emergent wetland types. The 11 acres of emergent wetland consist of a mixture of vegetation, with sedges and cattails dominating. In addition, some small pockets of open water are present under low flow conditions and, in some of the higher areas, willow/shrub wetlands are present.

Although the area is cut off from the direct flows of the Wisconsin River during the spring high water, it is still quite productive for wildlife.

F. Timing and Duration of Fill Material: The estimated construction of the levee system could begin with the beginning of the construction season in 1990 and be completed with the end of the construction season in 1992.

G. Description of Fill Material: The exact methods and equipment that would be used in the construction have not been specified at present because the exact source of the fill material has not been determined. However, the fill material would most likely be placed by mechanical means such as a front-end loader, trucks, and cranes.

II. Factual Determinations

A. Physical Substrate Determinations

1. Substrate Elevation and Slope: The portions of the levee extending into aquatic and wetland habitat would change the elevation of these areas. This is not unusual since now the areas of deposition and erosion occur naturally and constantly change in the river.

2. Sediment Types: The most obvious change would be from a wetland/aquatic soil to the dry soil of a levee. Section 2 of the levee would be stabilized with rock riprap and this would result in a change from a sand bank area to a rock bank area.

3. Fill Material Movement: Some movement of the fill material from the site may occur during construction, especially along section 2 of the levee. However, construction would not occur during periods of high flow on the Wisconsin River, and the coarseness of the fill material should minimize movement off the site during the construction. The higher energy area (section 2) would be stabilized with rock riprap shortly after construction and this should prevent any long-term movement from the site. Sections 1 and 3 of the levee system would be stabilized by grass plantings. Because these two sections are in a relatively low energy area, the vegetative stabilization should be adequate to prevent long-term movement of fill material from the site.

B. Water Circulations, Fluctuations, and Salinity Determinations

1. Water: General water chemistry and physical characteristics such as pH, temperature, color, odor, dissolved gas levels, and taste should not be impacted by the proposed fill activity. The clarity of the water in the immediate area may be diminished somewhat during construction, due to minor elevations in turbidity and suspended solids. Nutrient levels in fill material are expected to be low and, therefore, the fill activity should have no appreciable effect on eutrophication.

2. Current Patterns and Circulation: The area from the Highway 33 bridge downstream to 900 feet upstream of the Portage Canal would result in changes in current patterns and circulation. This area of the levee system will encroach on the average of 120 feet into the main channel of the Wisconsin River. In a short area immediately downstream of the Highway 33 bridge, the main channel of the Wisconsin River is already constricted, and the encroachment of 120 feet in this area would reduce the main channel by approximately 20 percent. This would minimally increase normal velocities and may change the current patterns in this area and areas immediately downstream. The extent this would influence current patterns downstream is unknown and almost impossible to predict. Changing current patterns and areas of deposition and erosion occur naturally on the Wisconsin River, and the biota present is adapted to these conditions. Therefore, it is expected that changes in current patterns would produce only negligible impact on the biota present.

Another possible area in which the proposed levee may impact water circulation is in the emergent wetland area, although it is difficult to assess because of a lack of information on drainage in the area. cursory soil surveys have indicated the presence of a water impermeable layer in the soils of this site. This, coupled with the fact that the entire emergent wetland area is cut off from other wetland areas by the existing levee and U.S. Highway 51 and 16, indicates that the major source of water is from direct precipitation rather than seepage and/or direct

input from other wetland and aquatic areas. If this is the case, the filling of 11 acres of the emergent wetland should have relatively minor impacts on water circulation in the unfilled portion of the emergent wetland area.

4. Actions Taken to Minimize Impacts: The levee width would be kept to a minimum to minimize encroachment into wetland areas and other aquatic areas and thereby reduce the impacts on water circulation and current patterns.

C. Suspended Particulate/Turbidity Determination

1. Suspended Particulates and Turbidity: Most of the fill material would not come in contact with the water during the placement activity and would be stabilized with vegetation or rocks prior to any inundation. Section 2 of the levee system would be placed in an unconfined riverine setting and may potentially cause elevated levels of suspended particulates and turbidity. However, due to the coarse nature of the fill material, any increases in suspended particulates or turbidity would not be significant, would be very localized, and would not extend very far downstream. With stabilization, no prolonged elevation in suspended particulates and turbidity should occur.

2. Effects on Chemical and Physical Properties of Water Column:

a. Light Penetration: Minor and localized elevations in turbidity and suspended particulates during construction may cause a reduction in light penetration in the water areas immediately adjacent to the project area.

b. Dissolved Oxygen: The fill material is expected to have low organic content and other oxygen demanding material. Therefore, there should not be any detectable impacts on dissolved oxygen levels.

c. Toxic Metals and Organics: In an aquatic system, contaminants that may be present tend to be associated with the finer particle sizes in the sediment. Since the sediments from the side channel or coarse material from an approved borrow pit that would be used for fill would not contain appreciable amounts of silts and clays, it is unlikely that the sediments would contain any significant amount of contaminants. Therefore, it is unlikely that the proposed fill activity would cause any appreciable elevations in toxic metals and organics in the water column. Some contaminants, mainly oil and grease from construction equipment, may enter the water column during construction.

d. Pathogens: Fill material would not contain any pathogenic organisms. The outfall from the Portage sewage treatment plant is located downstream of this side channel and therefore should not be a potential source of pathogenic organisms. The sediments in the side channel are subject to frequent and prolonged periods of desiccation and this would greatly reduce or eliminate any chance for pathogenic organisms to be present.

There is no reason to suspect the presence of pathogenic organisms in material taken from an approved borrow pit, if that becomes the selected source of fill material.

e. Aesthetics: The minor turbidity and suspended particulate elevations may reduce the aesthetic quality of the Wisconsin River during the construction.

3. Actions Taken to Minimize Impacts: Mechanical placement of the fill material would greatly reduce any potential impact on water quality in the area. Avoiding periods of higher river discharges would also greatly reduce any potential impacts on water quality in the area. Vegetative and rock stabilization should prevent any long-term impacts on water quality.

D. Contaminant Determinations: Because the fill material would be relatively uncontaminated coarse material, the proposed fill activity should not introduce, relocate, or increase contaminant levels in this area.

E. Aquatic Ecosystem and Organism Determinations

1. Effects on Plankton: The filling of the 10.7 acres of stream aquatic habitat and 11 acres of emergent wetlands would bury any plankton present and permanently remove those areas from any future plankton production.

Increases in turbidity and suspended particulates near the fill activities would have a localized suppressing effect on phytoplankton and zooplankton productivity. However, the plankton population should recover quickly once the fill and other construction activities cease.

2. Effects on Benthos: The filling of 10.7 acres of stream aquatic habitat along section 2 and 11 acres of emergent wetland along section 3 of the proposed levee would bury all benthic fauna present and permanently remove the area from any future benthos production. The existing benthos that would be buried along section 2 of the levee is probably characterized by low diversity and productivity, either because of the frequent and prolonged periods of desiccation or because of the coarse shifting sand substrate. The rock riprap would provide a hard and large surface area for benthos and would be colonized rather quickly by a much more diverse and productive benthic community after construction is completed. This may to a great extent offset the loss of the poorer quality stream aquatic habitat presently at this site.

The existing benthic community for the emergent wetland area is unknown. Emergent wetlands typically host a diverse and productive benthic community. This area may be slightly less valuable because it is cut off from surrounding wetlands and aquatic areas by the existing levee and

U.S. highway 51 and 16 and may subsequently be subject to anoxic conditions which would limit the benthic community. Filling the wetland would eliminate all existing benthic production in the 8 acres of wetland. The construction activities may also disrupt the benthic community in a narrow buffer zone immediately adjacent to the proposed levee.

In addition to the direct burial of benthic organisms discussed above, benthic fauna in areas immediately adjacent to and downstream would be subject to stress imposed by increased turbidity and suspended particulates. Sight and filter feeders would suffer decreased forage abilities while the fill activity is occurring. Because of the clean nature of the fill material, no toxic effects are expected on benthic organisms located on the periphery of the fill area. Changes in the current pattern in the Wisconsin River main channel would result in a temporary disruption of the benthic fauna until the area had time to come to a new equilibrium.

3. Effects on Fish: Most of the bottomland hardwoods and emergent wetlands are enclosed in the existing levee and are not attached directly to other wetland areas even under normal high water periods. Therefore, these areas have an extremely limited value to the fisheries of the Wisconsin River.

Encroachment into the main channel and side channel of the Wisconsin River by Section 2 of the levee system would cause some minor impacts on the local fisheries. Fish utilization of the project area during project construction would be reduced as a result of increased turbidity/suspended particulates and other construction activity. Fish utilization should return to near normal after construction is completed and the river channel reaches a new equilibrium. The burial of 10.7 acres of stream aquatic habitat would have an adverse impact on the local fisheries. However, this may be offset by the fact that the benthic community that would develop on the rock riprap may be more productive

and available for fish utilization. In addition, the rock would provide better cover for small fish than the present sandy bank and would provide spawning for certain species of fish.

4. Effects on Aquatic Food Web: The long-term effect of sections 1 and 2 of the levee system on the total productivity of the area is expected to be minor, although there would be a temporary disruption to the aquatic biota present and slight changes in localized community structure and composition. Section 3 of the levee system would cause some long-term changes in productivity of the localized area, by burial of the bottomland hardwoods and emergent wetlands. Because this area is closed off from other wetland areas by levees, the aquatic food web is probably more simplistic and dependent on its own production than other wetlands in this area. Therefore, modification of approximately 40 percent of this area by the fill activities may cause significant changes in the aquatic food web for the entire area within the existing levee.

5. Effects on Special Aquatic Sites

a. Sanctuaries and Refuges: The Swan Lake Wildlife Management Area (State owned) is located northeast of the city of Portage and is currently cut off from Wisconsin River floodwaters except for large floods. Therefore, the proposed levee should not cause any additional impacts to this area.

b. Wetlands: Approximately 41.2 acres of bottomland hardwood wetlands, with occasional pockets of emergent and open water shallow wetlands, would be permanently destroyed. Approximately 11 acres of additional emergent wetlands would also be destroyed by the proposed project. An unknown acreage of additional wetland areas immediately adjacent to the proposed fill area may be either temporarily or permanently disrupted by the fill activities. The impacts on the biota

and physical characteristics of the site have been discussed in previous and later sections.

6. Threatened and Endangered Species: The peregrine falcon is the only federally listed threatened or endangered species known to occur in Columbia County. This species is a transient during spring and fall migrations, although potential reintroduction sites along the Wisconsin River have been identified. The proposed activity should not interfere with these reintroductory efforts.

A number of other species on the Wisconsin endangered and threatened species list may occur in the area and include the following: red-shouldered hawk, black buffalo and speckled chub. Because of the availability of similar habitat in this area, the proposed fill activity should not have significant impact on these species.

7. Effects on Other Wildlife: Amphibians, such as the leopard frog, and reptiles, such as the painted turtle, are probably very abundant in the bottomland hardwoods and the emergent wetland areas along sections 3 and 1 of the proposed levee and depend on these areas for all phases of their life cycles. Many of the amphibians and reptiles present would be buried by the fill activity because of their limited mobility, but some would escape to surrounding areas. A limited amount of amphibian and reptile use of the completed levee may occur. However, for the most part, the area would be permanently removed from amphibian and reptile use. Mammals such as raccoons, mink, white-tailed deer, cottontail rabbit, red fox, eastern gray squirrel, star-nosed mole, white-footed mouse, deer mouse, meadow vole and various species of bats probably use to varying degrees the emergent wetland and/or bottomland hardwood that would be impacted by sections 1 and 3 of the levee. Most of the mammals present at the fill sites would be able to escape to surrounding areas because of their mobility. Due to the disturbance by construction of the levee, some species of mammals may utilize the wetland areas immediately adjacent to the proposed levee. Some mammal

use of the levee may occur when it has been completed if mowing is infrequent.

A variety of birds probably use the emergent wetland area and bottomland hardwoods that would be impacted by sections 1 and 3 of the levee system. Most birds would escape to surrounding areas. However, eggs and young that may be present would most likely be destroyed by the fill activity. The levee, if not mowed periodically, would have some value as a nesting and feeding area for certain grassland type species. However, it would not be as diverse and productive as it presently exists. Section 2 of the proposed levee system would have only minor impacts on wildlife.

F. Proposed Disposal Site Determinations

1. Mixing Zone: The mixing zone for chemical contaminants should be extremely small, due to the anticipated clean coarse nature of the fill material. The mixing zone for turbidity and suspended particulates is expected to be relatively small, not extending very far downstream due to the coarseness of the fill material and the stabilization of the fill material by rock or vegetation.

2. Compliance With Applicable Water Quality Standards: Due to the coarse, relatively uncontaminated nature of material to be used for fill, the proposed activity will comply with Wisconsin Water Quality Standards (Section NR 102, Wisconsin Administrative Code, November 1979) designed to protect fish and aquatic life and recreational use.

3. Potential Effects on Human Use Characteristics

a. Effects on Water-Related Recreation and Aesthetics: The existing levee already restricts the view of the Wisconsin River for the city of Portage and the widening and raising would further restrict the view. The fill activity along section 2 of the levee should not cause any appreciable negative impacts on boating, fishing, and other water-

related activities. In fact, the proposed rock riprap may attract fishermen to the area. Section 1 of the levee would cause minor short-term negative impacts on water-related recreation activities by modifying the existing access to the Wisconsin River. The proposed fill activity along Section 1 of the levee would modify a boat ramp presently located there but the access would continue to be available. Presently, the bottomland hardwoods and the emergent wetlands that would be impacted by the proposed section 3 of the levee are used for hiking, bird-watching, and other outdoor activities. The use of these areas for these activities would not be greatly reduced by the proposed fill activity.

b. Cultural Resources: The Portage Canal and the Zona Gale House are listed on the National Register of Historic Places, and will be affected by the proposed fill activity. In both cases, the fill activity associated with the proposed 550-foot floodwall immediately upstream of the mouth of the Portage Canal would be the source of the effect. Placement of this fill will be conducted in a manner that is in keeping with the Memorandum of Agreement presented in Attachment 1.

Based upon a reconnaissance survey conducted in 1981 by Joyce McKay, no areas of historic resources recommended for further study would be impacted by proposed fill activity. No known archeological resources would be impacted by the proposed fill activity. A more detailed discussion of potential impacts on cultural resources, including those not directly connected to the fill activity, may be found in the EIS.

G. Cumulative Effects on the Aquatic Ecosystem: Localized changes in the aquatic community and permanent loss of some aquatic habitat would occur as a result of the proposed fill activity. However, the overall effects on the aquatic ecosystem of the general area would be undetectable.

H. Secondary Impacts: The levee area would not receive any further development or provide potential for other impacts. Including the

wetlands located east of the city of Portage and north of U.S. Highway 51 and 16 within the 500-year flood protection system may encourage development of some of these areas. Most of this area is burned by the State of Wisconsin and development should be limited.

III. Findings of Compliance or Noncompliance With the Restrictions on the Discharge

This evaluation was prepared according to the 404(b)(1) guidelines of 24 December 1980, Federal Register, Vol. 45, No. 249. Several alternatives, including a nonconstruction alternative, were considered. For the Portage levee alternative, two alignments were considered for section 3 with the alignment for sections 1 and 3 remaining as presented in the selected plan. Section 3 of the levee system could have proceeded along the existing Portage levee. However, this alignment would have included the remaining bottomland hardwood forest and the emergent wetlands within the 500-year flood protection. Besides having greater cost, it was felt that this might encourage later filling and developing in the remaining wetland areas and therefore it was not selected. An alignment following the existing U.S. Highway was selected as part of the plan. The nonstructural alternative including evacuation of Ward 1 would be extremely costly. Since this alternative would not require any fill, no environmental impacts covered under 404(b) would be associated with this alternative.

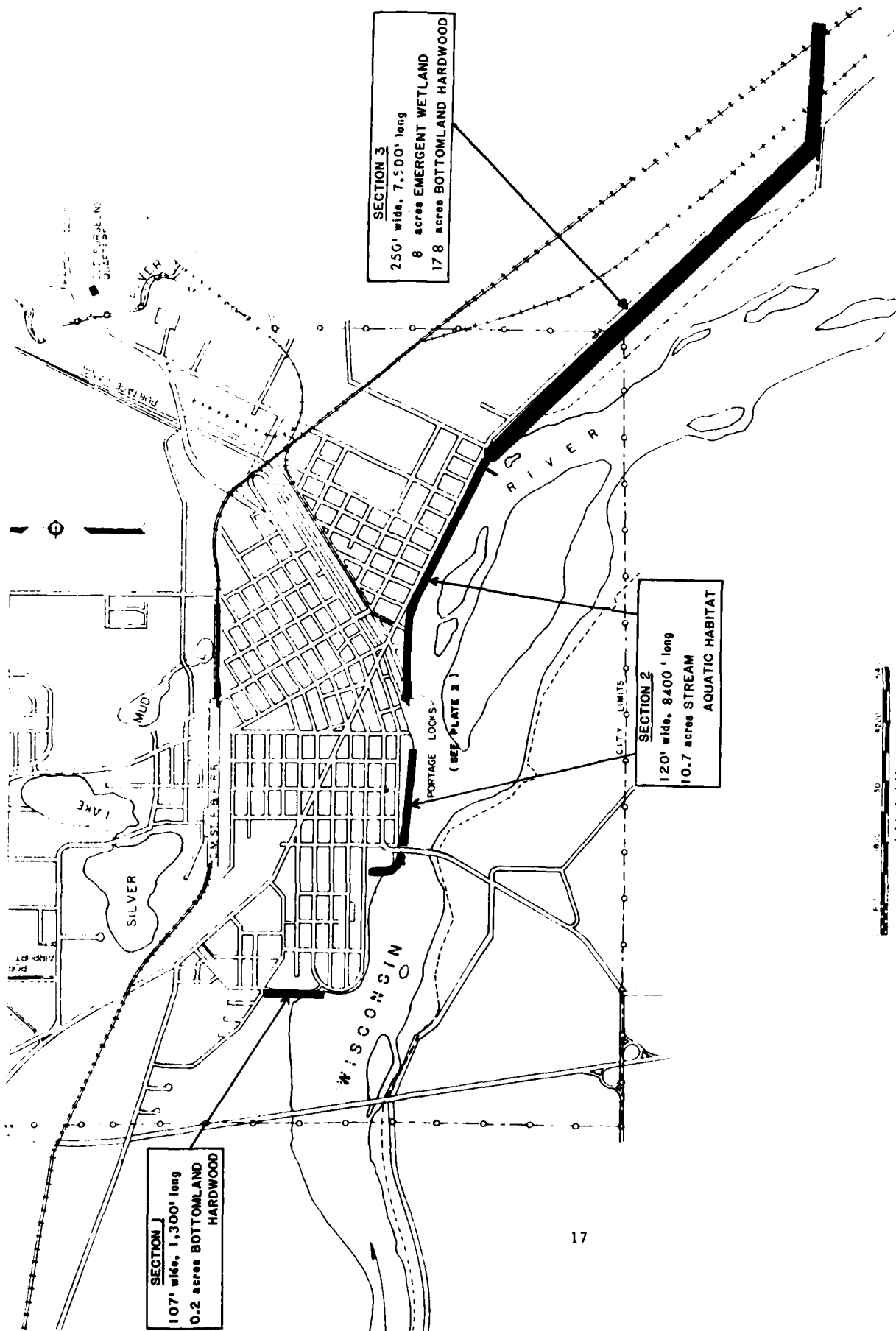
A more detailed description and evaluation of the potential impacts associated with each of the alternatives may be found in the EIS.

The proposed fill activity would be in compliance with applicable State Water Quality Standards, applicable Toxic Effluent Standards under Section 307 of the Clean Water Act, and the Endangered Species Act of 1973.

16 December 1983
Date



Edward G. Rapp
Colonel, Corps of Engineers
District Engineer



SECTION 1
107' wide, 1,300' long
0.2 acres BOTTOMLAND
HARDWOOD

SECTION 3
250' wide, 7,500' long
8 acres EMERGENT WETLAND
178 acres BOTTOMLAND HARDWOOD

SECTION 2
120' wide, 8,400' long
10.7 acres STREAM
AQUATIC HABITAT

PORTAGE LOCKS
(SEE PLATE 2)

CITY LIMITS

WISCONSIN

ATTACHMENT 1
LETTERS OF COMMENT
AND
CORPS RESPONSES

December 1983

ATTACHMENT 1
LETTERS OF COMMENT AND CORPS RESPONSES

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LETTERS REQUIRING RESPONSES



UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

REGION V
230 SOUTH DEARBORN ST
CHICAGO, ILLINOIS 60604

12 SEP 1983

Colonel Edward G. Rapp
District Engineer
St. Paul District, Corps of Engineers
1135 U.S. Post Office and Custom House
St. Paul, Minnesota 55101

NEPA-DE-COE-F36119-WI(83078)

Dear Colonel Rapp:

The U.S. Environmental Protection Agency has reviewed the Draft Feasibility Report and Draft Environmental Impact Statement (DEIS) for the Wisconsin River at Portage, Columbia County, Wisconsin Flood Control Project. After evaluation of four alternatives, the DEIS proposes constructing new levees, raising and widening existing levees, raising a road, replacing the riverward lock gates at the Portage Canal and constructing a concrete floodwall upriver of the lock structure.

- The DEIS does not describe the type of construction activity anticipated to complete this project. Localized construction activity can cause increased noise, air pollution, soil erosion and water quality problems. Construction impacts should be clearly identified in the Final Environmental Impact Statement together with a specific plan and system of accountability to minimize them. The DEIS states that the borrow material sites have not been selected and further study will be needed. We wish to be included in the review of these studies when they are completed.
1. noise, air pollution, soil erosion and water quality problems. Construction impacts should be clearly identified in the Final Environmental Impact Statement together with a specific plan and system of accountability to minimize them.
 2. The DEIS states that the borrow material sites have not been selected and further study will be needed. We wish to be included in the review of these studies when they are completed.

Based on our review of the DEIS, we support the "Refinement to the Portage Levee Alignment" alternative. It satisfactorily meets project objectives while enhancing and protecting wetlands and floodplain forest. Additional information is needed to assess construction and borrow material acquisition impacts. Therefore, we are rating the project LO (lack objections) and the EIS as Category 2 (additional information requested). Notice of availability of our comments will be published in the Federal Register in accordance with our responsibility under Section 309 of the Clean Air Act, to inform the public of our views on proposed Federal actions.

If you have any questions about our review, please call Mr. Wayne Elson of my staff, at 312/886-6693.

Sincerely yours,

James P. Backley
Barbara Taylor Backley, Chief
Environmental Review Branch
Planning and Management Division

CORPS RESPONSES TO THE ENVIRONMENTAL PROTECTION AGENCY

REPLY TO ATTENTION OF

1. The draft environmental impact statement has been modified to address impacts related to construction activities.
2. The U.S. Environmental Protection Agency will be provided the opportunity to review any future environmental studies completed as part of the Portage flood control project.



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
Atlanta GA 30333
(404) 452-4257
August 29, 1983

Colonel Edward G. Rapp
District Engineer
St. Paul District, Corps of Engineers
Department of the Army
1135 U.S. Post Office & Custom House
St. Paul, Minnesota 55101

Dear Colonel Rapp:

We have reviewed the Feasibility Report and Draft Environmental Impact Statement (EIS) for Wisconsin River at Portage, Wisconsin. We are responding on behalf of the U.S. Public Health Service.

We have reviewed this document for possible health effects and find that adequate consideration has been given to the alternatives with one exception. No mention was made of mosquito or other vectors. The Final EIS should provide a discussion of present and anticipated mosquito problems as a result of this project, particularly in the levee borrow area. If control measures are needed, what control measures will be used? What uses of insecticides, if any, are planned? How would they be applied and in what quantities?

Thank you for the opportunity to review this document. We would appreciate receiving a copy of the Final EIS when it becomes available. Should you have questions concerning our comments, please contact Mr. Lee Tate at FTS 236-4161.

Sincerely yours,

Frank S. Lisella, Ph.D.
Chief, Environmental Affairs Group
Environmental Health Services Division
Center for Environmental Health

CORPS RESPONSES TO THE PUBLIC HEALTH SERVICE

1. Although a few isolated cases of encephalitis and problems with rats occur in Columbia County, there have been no public health problems related to mosquitoes or other vectors in the Portage, Wisconsin, area (personal communication with the County Health Officer). When constructed, the levees along the Wisconsin River would not alter existing flow patterns or cause the impoundment of floodwaters that could potentially provide additional habitat for mosquitoes or other vectors. Interior ponding areas A and B currently exist and would not significantly change from existing conditions. Suitable construction materials such as rock and clay would be obtained from sources outside the study area, while sand could be obtained from the riverbed. Although the removal of sand from the river would leave a large pool area, this condition would be temporary because of the large amount of sand that the river normally carries. Overall, the proposed project would not substantially change present conditions or cause future problems with mosquitoes or other vectors. Hence, no control measures or insecticide application programs would be required.



U.S. Department of Housing and Urban Development
Milwaukee Area Office, Region V
310 West Wisconsin Avenue, Suite 1380
Milwaukee, Wisconsin 53203

August 16, 1983

Department of the Army
St. Paul District, Corps of Engineers
ATTENTION: Plan Formulation Branch
Planning Officer
1135 U.S. Post Office & Custom House
St. Paul, Minnesota 55101

Dear Colleague:

SUBJECT: Comments on Feasibility Study for Flood Control
Wisconsin River at Portage, Wisconsin

Having reviewed the Draft Environmental Impact Statement (DEIS) written by the U.S. Army Corps of Engineers for the captioned project, we have the following comments which should be addressed in the Final Environmental Impact Statement (FEIS).

1. The FEIS should include a map which identifies, where applicable, all of the alternatives reviewed. This will assist the reader in gaining a perspective of the magnitude of each alternative.
2. The FEIS should include a cost analysis which,
 - a. Identifies the long term costs of taking no action.
 - b. Identifies the long term costs of relying solely on flood insurance as a means of flood loss protection.
 - c. Projects the cost of acquisition and/or moving all structures out of the floodplain.
 - d. A projection of the cost for each alternative.

If you have any questions regarding these points, please contact Mr. Robert Goulka, Environmental and Planning Officer, at 414/291-3355.

Sincerely,

Tyoy L. Stigsby
Area Manager, 535

CORPS RESPONSES TO THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

1. A map detailing each of the alternatives reviewed in the environmental impact statement is provided in appendix A as identified in the EIS, paragraph 3.01. This was done to lessen the duplication of information in the EIS that also appears in the main engineering report and its technical appendices. However, in order to provide an immediate comparison of those alternatives that were considered in detail, a map of each has been added to the EIS.
- 2.a. The long-term cost of taking no action would be the same as the average annual damages that would occur to the study area. This value, approximately \$954,000, has been added to the EIS. See paragraph 3.16 of the EIS.
- 2.b. The long-term cost of relying solely on flood insurance for flood protection would not change the average annual damages of \$954,000 for the study area.
- 2.c. The cost of removing all of the structures from the 100-year floodplain would be \$15,622,000. This value appears in paragraph 3.21 of the EIS.
- 2.d. The cost of each alternative that was evaluated can be found in appendix A of the technical appendices.



State of Wisconsin / DEPARTMENT OF NATURAL RESOURCES
Carroll D. Besadny
Secretary

BOX 7921
MADISON, WISCONSIN 53707

September 22, 1983

File Ref 1650-2

Colonel Edward G. Rapp
District Engineer
St. Paul District, Corps of Engineers
1135 U. S. Post Office and Custom House
St. Paul, MN 55101

Attention: Planning Division, Plan Formulation Branch

Dear Colonel Rapp:

The Department of Natural Resources has reviewed the draft feasibility study and environmental impact study for the Wisconsin River at the Portage flood control project and has the following comments:

1. The proposed levee alignment will require filling on the bed of the Wisconsin River. This will require a Chapter 30.12, Wis. Stats., permit. If the Corps decides to use sand from the river for building the levee, a Chapter 30.19 and/or 30.20, Wis. Stats., permit for enlargement and/or dredging will eventually be required. Details concerning the location and extent of the proposed dredging would be necessary in assessing permit issuance for dredging.
2. It is apparent the Corps of Engineers has decided against the non-structural alternative. The Department believes the Draft EIS could give better treatment to a combined solution of both structural and non-structural measures. For example, the Corps should investigate non-structural alternatives for Caledonia Township. A real stronghold of opposition to the plan is the people behind the Caledonia levee as they feel the plan ignores their flooding problems. The charge of the study was to investigate the feasibility of flood control for the Portage area including Caledonia and Lewiston townships. The study investigated the feasibility of structural but not non-structural alternatives for these areas.
3. In selecting a design flood profile for the project, the Corps has assumed the Caledonia and Lewiston levees would not fail; but would overtop in times of flooding. This gives the highest flood profile. Based on this assumption, construction of the Portage levee would not increase the flood stages significantly. While this may be

CORPS RESPONSES TO THE WISCONSIN DEPARTMENT OF NATURAL RESOURCES

1. Comment noted.
2. Equal attention was given to structural and nonstructural solutions for the floodprone areas within Columbia County. A nonstructural solution was carried through the plan formulation process and, in fact, was recommended for the floodplain area outside the city of Portage. The nonstructural portion of the recommended plan includes the continuation of the floodplain regulation, flood insurance, and flood forecasting and warning programs and recommends that the Wisconsin Department of Natural Resources continue to maintain the remaining existing levees within the county. No other nonstructural solutions were found worthy of further consideration.
3. The without project condition assumes that the existing levee system will remain in place but will be breached for any flood event (especially at critical levee sections) and will be overtopped for certain flood events. Breaching would not result in complete levee failure as the remainder of the levee system would continue to be effective, with the majority of flood flows being confined to the area riverward of the levee system. The hydraulic analysis confirms this by establishing adjacent land areas as part of a lateral reservoir system with the Wisconsin River floodway area (between the levees) conveying most of the total flow. Given the present without condition, no measurable hydraulic or hydrologic effects would occur to the river stages or discharges, respectively, as a result of implementation of the selected plan. The floodway would remain as is with no increase in the Wisconsin River water surface profiles. The floodplain would be modified only in the Portage area. Since no change would occur in the other areas, the purchase of flowage easements would not be required as part of the selected plan.

proper from a design standpoint, the present floodplain maps adopted by Columbia County and Portage assume the levees are non-existent, implying a much lower flood profile. Under this assumption, construction of the Portage levee would increase the regulatory flood profile in Caledonia township by approximately 1.5 feet. (If the Portage levee is built and approved by DNR and the Federal Emergency Management Agency (FEMA), the area behind the Portage levee can be removed from the floodplain, but the areas behind the Caledonia and Lewiston levees would still be zoned floodplain.)

In summary, the Portage levee would meet the standards of removing the Portage area from the floodplain, but approval of the new map or profile for the Caledonia and Lewiston areas would require the purchase of easements. The Corps considers this a local responsibility but the issue still illustrates a conflict that should be addressed in the report or EIS.

Relocating the Section 3 dike adjacent to Highway 51 is desirable for it will provide protection to additional floodplain acreage. We would suggest further that the old dike presently located along this portion of the river be removed. This would make the remaining acreage contiguous to the river. An added benefit is that the material from the old dike could be used to construct the new facility.

General - The recommended plan involves improvement to the Portage levees. Levees are only a temporary solution to the flooding problem at Portage. Over time the levees wear out and need a great deal of repair which obviously involves additional expense. Levees frequently leak, they breach and overtop in extreme situations. We do not believe that the proposed levee will permanently solve the flooding problems at Portage.

Once the levees are in place, the landward acreage is open to immediate development. In time, when the levees deteriorate, leak, or are overtopped, the financial losses caused by the flood waters increase accordingly. Federal and state policy makers are confused about how to regulate and insure the areas landward of the levees since they could, at some point in the future, still be subject to flooding, regardless of how they are designed. Therefore, in view of these problems, it would seem to us more logical to implement the nonstructural approach to the Portage flooding problem, as we have advocated in the past.

4. In future studies, consideration will be given to removing the existing levee downstream of Portage and using the material to construct the new levee.

5. A permanent flood control project is not a temporary measure. The economic life of most flood control projects is normally 100 years, while the actual life of Corps of Engineers permanent projects, if properly maintained, is considered indefinite. A project does not disappear when the economic life is reached. Instead, proper operation and maintenance permit the project to perform as intended for an indefinite period. Further, operation and maintenance of Corps of Engineers projects is perpetual by legal contract with the local sponsor. Section 208.10, Title 33, CFR contains Federal regulations for the operation and maintenance of local flood protection works. Once a Corps project is constructed, regular periodic inspections are conducted by the Corps to assure that the project is being operated and maintained properly. Thus, Corps of Engineers flood control projects are permanent, not temporary, measures for flood protection.

6. The intent of this section of the report was to briefly present each plan's component parts and to define the critical areas within each plan. Since the development of recreation facilities and aesthetic measures was not critical to the selection of the plan for constructibility, a detailed discussion was not necessary. However, appendix H provides information on recreational facilities and aesthetic measures including the boat launching facility upriver from Pauquette Park. A reference to this appendix will be noted in the final feasibility report.

7. Section 208.10, Title 33, CFR, contains regulations for the operation and maintenance of local flood protection works. In addition to this requirement, the prescribed maintenance and operation procedures would appear in the operation and maintenance manual which is normally developed during the final stages of project construction. Prior to the

Specific Comments

Feasibility Study, Page 54 - More details about the proposed recreational facilities and aesthetic measures are suggested, particularly regarding any replacement access boat launching facilities (mentioned on page EIS-43).

Feasibility Study, Page 77 - What are the prescribed regulations for maintenance and operation of the levee?

Draft EIS, Page 23 - The 41.2 acres of floodplain forest are also considered wetlands, as is noted on page 5 of the Section 404(b)(1) report.

Draft EIS, Page 24 - This section should reference the discussion of wildlife impacts contained on pages 13-15 of the Section 404(b)(1) report.

Draft EIS, Page 37 - It is also suggested that this discussion reference the discussion of current patterns and circulation found on page 7 of the Section 404(b)(1) report.

Draft EIS, Page 38 - We concur that further study is needed concerning the locations and impacts of obtaining borrow/sand material for the levee.

Draft EIS, Page 43 - Public access to navigable waters may not be removed or vacated except with approval of the Natural Resources Board. Policies contained in Chapter NR 1.91, Wisconsin Administrative Code, would be followed.

Draft EIS, Page 46, Sections 6.04-6.05 - There is an obvious need for continued coordination with the Department and the U. S. Fish and Wildlife Service in completing remaining elements of this study. The Department intends to assist to the fullest degree possible in helping to meet these needs.

The above comments on the feasibility study and draft EIS have been prepared to assist the Corps of Engineers in completing this study. These comments are intended to supplement our previous comments of January 10, 1983 and April 24, 1981. Thank you for the opportunity to review these documents.

Sincerely,

Bureau of Environmental Impact



Howard S. Dfuckenmiller
Director

cc: Robert Roden - WR2/5
Douglas Morrisette - SD

approval of this manual by the Secretary of the Army, the local sponsor would be provided an opportunity to review it and provide recommended changes. Once complete, the manual would be given to the local sponsor when the project is transferred from Government ownership to sponsor ownership.

8. The identification of floodplain forest as a wetland on page 5 of the 404(b)(1) evaluation has been changed to reflect the EIS classification.

9. A reference to the discussions on pages 13-15 of the 404(b)(1) evaluation has been added to table 2, Comparative Impacts of Alternatives, of the EIS.

10. The discussion on current patterns and circulations on page 7 of the 404(b)(1) evaluation has been referenced in the EIS as suggested.

11. No response necessary.

12. During the detailed design of the Summit Street road raise, which would also include the existing boat launch facility, close coordination would be maintained with the Wisconsin Department of Natural Resources to insure that the policies contained in Chapter NR 1.91 of the Wisconsin Administrative Code are followed.

13. No response required.

14. Response to comments received on 24 April 1981 and 10 January 1983 were incorporated into the final report and final EIS.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration

OFFICE OF THE ASSISTANT SECRETARY

September 12, 1983

Colonel Edward G. Rapp
District Engineer
U.S. Army Engineer District, St. Paul
1135 U.S. Post Office and Custom House
St. Paul, Minnesota 55101

Dear Colonel Rapp:

This is in reference to your draft environmental impact statement entitled "Wisconsin River at Portage, Wisconsin." The enclosed comment from the National Oceanic and Atmospheric Administration is forwarded for your consideration.

Thank you for giving us an opportunity to provide comments. We would appreciate receiving two copies of the final environmental impact statement.

Sincerely,

Joyce M. Wood
Joyce M. Wood
Chief

Ecology and Conservation Division

Enclosure





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NAT. OCEANIC & ATMOSPHERIC ADMINISTRATION
WASHINGTON, D.C. 20541

SEP - 7

CORPS RESPONSES TO THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

TO: PP2 - Joyce Wood

FROM: N - K. E. Taggart

SUBJECT: DEIS 8307.19 - Wisconsin River at Portage, Wisconsin,
Feasibility Study for Flood Control (Department of the Army -
St. Paul District, Corps of Engineers)

1. A review of existing records indicates that no geodetic control monuments would be disturbed or destroyed by implementation of the selected plan.

The subject DEIS has been reviewed within the areas of the National Ocean Service's (NOS) responsibility and expertise, and in terms of the impact of the proposed action on NOS activities and projects.

1. Geodetic control survey monuments may be located in the proposed project area. If there is any planned activity which will disturb or destroy these monuments, NOS requires not less than 90 days' notification in advance of such activity in order to plan for their relocation. We recommend that funding for this project include the cost of any relocation required for NOS monuments. For further information about these monuments, please contact Mr. John Spencer, Chief, National Geodetic Information Branch (N/CG17), or Mr. Charles Novak, Chief, Network Maintenance Section (N/CG162), at 6001 Executive Boulevard, Rockville, Maryland 20852.





State of Wisconsin

DEPARTMENT OF TRANSPORTATION



August 31, 1983

CORPS RESPONSES TO THE WISCONSIN DEPARTMENT OF TRANSPORTATION

BUREAU OF ENVIRONMENTAL
AND DATA ANALYSIS
4802 Sheboygan Avenue
P.O. Box 7916
Madison, WI 53707-7916

Colonel Edward G. Rapp, District Engineer
Department of the Army
St. Paul District, Corps of Engineers
1135 U.S. Post Office & Custom House
St. Paul, MN 55101

Attn: Plan Formulation Branch
Planning Division

Colonel Rapp:

We have reviewed the draft Environmental Impact Statement (EIS) for the Wisconsin River at Portage, Wisconsin, feasibility study for flood control and offer the following comments:

1. We are concerned about the potential for flooding of State Trunk Highway (STH) 33, STH 78, and Interstate Highway (IH) 90/94 should the Caledonia dike be breached or overtopped by a 100 year (or lesser) frequency flood. Since it appears most likely that STH 33 and STH 78 would be most seriously affected by floods, it would be desirable to keep these major highways open during the 50 to 100 year frequency floods because of the public investment involved and the access they provide into and out of the area. The rehabilitation of the Caledonia Levee for a 100 year frequency flood should be considered to keep these major highways open and provide a degree of protection to developments south of the levee.
2. We believe Plate 6 in the feasibility study is erroneous because it does not show flooding across USH 51 south of Portage.

Thank you for the opportunity to review and comment on this draft Environmental Impact Statement.

Cynthia A. Morehouse

Cynthia A. Morehouse, Director

JBN:50831834

cc: Trans. Dist. 1

1. Improvement of the Caledonia levees was found to be not economically justified. Therefore, no additional work on the Caledonia levees was recommended. However, because of your concern, it was recommended that the Wisconsin Department of Natural Resources continue to maintain those levees.

2. Plate 6 of the main report shows a with project floodplain map. Given this condition, flooding would not cross U.S. Highway 51 south of Portage.

CORPS RESPONSES TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY

July 28, 1983

MEMORANDUM FOR: FEMA Environmental Officer

FROM: Chief, Natural Hazards Branch - Region V

SUBJECT: FEMA Region V comments about the Draft Main Report with Draft EIS, Wisconsin River at Portage, Wisconsin

Thank you for this opportunity to review the Draft Main Report with Draft EIS, Wisconsin River at Portage, Wisconsin. The technical results of this report are consistent with the Flood Insurance Study (FIS) for that locality. Both studies were prepared by the Corps of Engineers (COE) in collaboration with the Wisconsin Department of Natural Resources and the United States Geological Survey using the identical model.

The Draft Main report did not mention the FEMA levee policy, that is, the direct implication for flood insurance requirements and flood plain management regulations if the COE met these criteria for flood protection.

We hope that these remarks are useful to you.

Gary E. Pierson

RS-MATHD-AB-bb ext. 6-5436 25th flr. 7/28/83

CC: Reader File

Debat File

Mr. William C. Tidball

Mr. Charles Crist, Project Manager - COE St. Paul District

CONCURRENCE: AB LS GP

1. The final report has been modified to indicate that flood insurance and floodplain management regulations would not be necessary in the area protected by implementation of the selected plan.

CORPS RESPONSES TO MS. FREDERICA KLEIST

Portage, WI 53901
July 29, 1983

Charles Crist
Corps of Engineers, Department of Army
St. Paul District
1135 U S Postoffice & Custom House
St. Paul, Minn. 55101

Dear Mr. Crist:

Thank you for sending the Wisconsin River Study draft with appendices attached to Attorney Roger Buffet and myself. It is important to have this material for reference.

My comment is "that it is a good one." However, I do believe that the Wisconsin Lock should be operable. To close this lockwall at time of construction would have an adverse effect on any recreational development. It would be cheaper to make it operable at the time of construction than to reopen at a future date, at an added expense.

Canoelists like to go down the canal from the Wisconsin River into the Fox River. As it is now, they have to Portage around the lock and ask permission to launch below the lock. As you must know David Bennett has taken that area and has it marked "private property." I believe canal and levee right of way should be open for public use and access.

An enclosing a recent article about the canal as part of the downtown revitalization program.

Will be looking forward to your hearing in Portage.

Sincerely,

Frederica Kleist
Frederica Kleist
528 West Cook St.
Portage, WI 53901

1. Comment noted.

RAIN continues through Thursday. Highs today mid 60 to mid 70s. Lows upper 50s to mid 60s and warmer Thursday with highs in the 70s to mid 80s.

Canal Society takes a step

canal from page one

would aim at persuading governmental entities such as the city council and the state legislature. Thirdly, he said, "We should educate our potential sources of money."

"This all comes back to the issue of money," he said. "How big is the job and how much is it going to cost?"

TUESDAY'S MEETING was unable to come up with an answer to that question, but members were given assignments aimed at producing a ball-park estimate when the group meets again in July. Stitt also suggested arranging an all-day workshop this Fall to hear presentations by people from cities that have successfully carried out similar projects.

"We were able today to see a working relationship between the Canal Society and the downtown revitalization project," Stitt said after the meeting. "We established priorities, straightened out some of the complex issues involved, and set tasks and the next steps we need to take."

"I think the Canal Society has made a lot of headway," he added. "They've already done an incredible amount of research. But there's a lot left to be accomplished."

The Portage canal: History gets a chance at the future

By SHELTON RAMPTON
Daily Register Writer

PORTAGE — Bert Stitt, the community development specialist with Wisconsin's department of development who has been working with Portage's downtown revitalization group, led the Portage Canal Society through the first steps of a systematic plan for restoration of the Canal.

"I'm being a little bit of a dictator," he explained as he prodded discussions during a Tuesday luncheon with Canal Society and downtown revitalization members. His insistence on order during the meeting was strict and occasionally blunt. At one point he hushed people for whispering while another person was speaking. But those present seemed to agree that he was producing results.

"WE HAVE APPARENTLY established order in genteel chaos. Thank you," said Canal Society member Blanche Murtagh as the meeting ended.

During its years of existence, the Canal Society has earned out extensive research in hopes of restoring the Canal, but concrete accomplishments have yet to materialize. During Tuesday's meeting, Stitt asked Society

members to identify the factors preventing them from achieving their goals, and isolated three main answers: public apathy, lack of funds, and legal complications involving property ownership.

The property ownership complications date back a century, Society members explained, to a judge's decision allowing sale of a right-of-way land along the canal. The judge's decision was invalid because it violated a supreme court ruling, said Frederica Kleist, the Society's corresponding secretary. But reasserting the state's ownership of the land would provoke opposition from current landholders along the Canal, requiring an expensive and time-consuming legislative or court battle.

"I believe the best thing we can do right now is get some water running through the canal and get rid of the pollution," said Society member Frank DeLoughery. He estimated that such a goal could be accomplished at a cost of about \$25,000. But Kleist said more money would be needed.

"YOU'RE AIMING too low in terms of dollars," Kleist said. "\$50,000 is minimal in terms of what needs to be done."

Stitt also emphasized the importance of funding for the success of any effort to improve the canal. "You need money even to be taken seriously by the people we're dealing with," he said. "And it's going to take money to do an education program. It's going to take money to review and revamp plans, or to engage in court actions. We need money even to do the preliminary things that Frank is talking about."

The meeting hammered out a rough picture of the process necessary to establish state ownership of the canal land. First, a city statement endorsing the canal project would be needed, which could then be used with letters petitioning the state legislature to pass a measure confirming the state's ownership.

STITT WARNED, however, that the city council might be wary of endorsing the Canal Society's plans, both because of opposition from landholders along the canal and unwillingness to accept the financial burden of canal renovations. Likewise, the state legislature might fail to pass legislation affirming state ownership, which by extension would make the state responsible for upkeep of the canal.

If legislative efforts to establish

canal ownership fail, court action could be taken to accomplish the same purpose, but estimates of the time required to win such a lawsuit ranged as high as a tree to ten years.

In order to overcome these obstacles, Stitt said, "a first-class educational effort is required." He suggested that educational programs aim at three separate groups. The first would be a public relations effort geared to the public at large. The second

canal turn to page 3



BERT STITT



CORPS RESPONSES TO THE STATE HISTORICAL SOCIETY OF WISCONSIN

HISTORIC PRESERVATION DIVISION

August 26, 1983

Colonel Edward G. Rapp
St. Paul District, Corps of Engineers
1135 U.S. Post Office and Custom House
St. Paul, Minnesota 55101

SHSM: 1389-80
RE: Flood Control
Wisconsin River
@ Portage

Dear Colonel Rapp:

Our staff has reviewed the "Feasibility Study" and the "Draft Environmental Impact Statement for Flood Control Wisconsin River at Portage, Wisconsin" in accordance with the "Procedures for the Protection of Historic and Cultural Properties" (36 CFR 800).

We agree in principal with the measures outlined in the Draft Environmental Impact Statement to mitigate the adverse impact that the preferred alternative would have on the Portage Canal and the Zona Gale House, properties listed in the National Register of Historic Places. We further agree that the preferred alternate will have no adverse effect on those qualities of Wauona Trail which made it eligible for listing in the National Register. Finally, we agree that the additional studies described in the cultural resources appendix should be undertaken to identify and evaluate the significance of any historical or archeological resources in these portions of the project area which have not yet been surveyed for cultural resources.

We recommend that in accordance with the Advisory Council on Historic Preservation's supplementary guidance issued on July 9, 1982 (copy enclosed), that the St. Paul District prepare a Memorandum of Agreement (MOA) on this project for review by our office and the Advisory Council. To help you prepare the MOA, I am enclosing a copy of the Advisory Council's Manual of Mitigation Measures. A copy of the final MOA, signed by all interested parties, should appear in the Final Environmental Impact Statement.

1. The Memorandum of Agreement has been prepared and signed; it is included in the final main report and appendices.

Colonel Edward G. Rapp - 2

August 26, 1983

If you have any questions concerning this matter, please contact
Richard W. Dexter at (608) 262-2732.

Sincerely,



Jeff Dean

State Historic Preservation Officer

JD:1kr

Enclosure

cc: Michael Quinn, ACHP
Henry Abraham

Advisory Council On Historic Preservation

The Old Post Office Building
1100 Pennsylvania Avenue, NW, #909
Washington, DC 20004

CORPS RESPONSES TO THE ADVISORY COUNCIL ON HISTORIC PRESERVATION

SEP 26 1983

Mr. Edward G. Rapp
Colonel, Corps of Engineers
District Engineer
1135 U. S. Post Office & Custom House
St. Paul, MN 55101

Dear Colonel Rapp:

Thank you for transmitting the feasibility report and Draft Environmental Impact Statement for flood control on the Wisconsin River at Portage, Wisconsin. From our review of this document, we have concluded that it presents a sound justification of its tentative selection of a recommended plan and a thorough analysis of impacts on historic properties and alternatives to mitigate or lessen these impacts. As a result, we believe that the document is adequate as a preliminary case report for the consultation prescribed in the Council's regulations, 36 CFR Part 800.

We are particularly pleased with the inventiveness of the mitigation proposed for the adverse effect on the Portage Canal, an important historical property in this region. Replacing an existing lock with a taller lock structure will preserve the overall appearance and associations of the Canal and yet allow the completion of a continuous, higher levee. We also agree with your recommendations for mitigation at the Zona Gale House and for proceeding in those portions of the project area that have not yet been surveyed. Based on our conclusions and on the Wisconsin State Historic Preservation Officer's (SHPO) comments of August 26, 1983, it is clear that all parties have reached agreement that your proposal is a prudent and satisfactory means of mitigating the effects of the proposed flood control project. Therefore, we recommend that the Corps prepare a Memorandum of Agreement incorporating this proposal. The procedure for this is set forth in Section III. A. of the Council's Supplementary Guidance: Preparation of Memoranda of Agreement (copy enclosed). The Agreement should be submitted to the Council signed by both the Corps and the Wisconsin SHPO.

1.

1. The Memorandum of Agreement has been prepared and signed; it is included in this document.

If we can be of any additional help in this process, please contact Mike Quinn at (202) 786-0505. Again, we appreciate the effort and the consideration that has gone into the Corps's planning for the historic properties affected by this project.

Sincerely,



Dan L. Klima
Chief, Eastern Division
of Project Review

Enclosure

1

Supplementary Guidance: Preparation of Memoranda of Agreement

Issued July 9, 1982

Supplementary Guidance: Preparation of Memoranda of Agreement

On June 4, 1982, the Advisory Council on Historic Preservation (Council) temporarily suspended its regulations at 36 CFR 800.6(c)(1) which set out directions for preparation of Memoranda of Agreement. (See 47 FR 24306.)

The Council has prepared the following "Supplementary Guidance: Preparation of Memoranda of Agreement" for Federal agencies, State Historic Preservation Officers, and other interested parties to use in lieu of 36 CFR 800.6(c)(1).

The purpose of the suspension and these guidelines is to introduce more flexibility into the Memorandum of Agreement process while providing sufficient direction for the adequate preparation of Memoranda of Agreement. The suspension and guidelines do not relieve Federal agencies of any other responsibilities regarding Memoranda of Agreement that are contained in other provisions of 36 CFR Part 800.

The guidance which follows was published in the FEDERAL REGISTER on July 9, 1982, Vol. 47, No. 132, page 29861.

I. Purpose

This guidance is issued in accordance with 36 CFR §800.14 and provides Federal agencies, State Historic Preservation Officers, and other interested parties with information to assist in the preparation of Memoranda of Agreement (MOA) that are used to meet the requirements of Section 106 of the National Historic Preservation Act. This guidance is in lieu of the provisions of 36 CFR §800.6(c)(1), which have been suspended. Suspension of 36 CFR §800.6(c)(1) does not eliminate other provisions of 36 CFR Part 800 regarding Memoranda of Agreement.

II. Policy

A duly executed MOA constitutes the comments of the Council and evidences that a Federal agency has taken into account the effects of its undertaking on historic properties. It is a contractual document setting forth the rights and responsibilities of the signatories. As such, it must be precise in its terms and clearly understandable as to the intent of the parties should a question arise regarding compliance with the MOA. Within this framework, MOAs should be crafted to meet the particular needs of each undertaking and the consulting parties. In reviewing MOAs, the Executive Director will seek to ensure that they accurately and concisely set forth the agreements reached by the parties and that they are then executed with a minimum of paperwork and delay. Objections to a proposed MOA will be based on questions relating only to substantive matters, the clarity of the MOA, or legal sufficiency. Elements strictly of form will not be a basis for rejecting a proposed MOA.

III. Preparation of an MOA

Depending on the circumstances of the particular undertaking, an Agency Official may elect to follow either the normal process of preparing an MOA or an expedited method. An Agency Official is encouraged to assume responsibility for preparing an MOA and should select the method most appropriate to the particular undertaking and its effects. An applicant for Federal assistance or approval may draft the MOA.

A. Normal Process

When the consultation process (Section 800.6(b)) has been substantially concluded and the Agency Official, the SHPO, and the Executive Director have reached agreement on feasible and prudent alternatives to avoid or mitigate the adverse effects of the undertaking and on proposed language for an MOA, the Agency Official should prepare the final MOA, unless the consulting parties determine otherwise. The Agency Official may submit to the Executive Director for review the MOA with the signature of the SHPO and, when appropriate, any other signatory or concurring parties. If the Executive Director determines that it accurately reflects the agreement of the consulting parties, he shall sign it and forward it within 10 days to the Chairman for ratification in accordance with Section 800.6(c)(2). If the Executive Director determines the MOA is deficient, he may return it to the Agency Official for revision or may prepare an alternate MOA.

Alternately, to assist in focussing the consultation, a proposal for an MOA may be developed jointly by the Agency Official and the SHPO prior to

WHEREAS, the [agency] has determined that [undertaking] will have an effect upon properties included in or eligible for inclusion in the National Register of Historic Places and has requested the comments of the Advisory Council on Historic Preservation pursuant to Section 106 [and Section 110f] of the National Historic Preservation Act (16 U.S.C. 470) and its implementing regulations, "Protection of Historic and Cultural Properties (36 CFR Part 800),"

NOW, THEREFORE, the [agency], the [State] Historic Preservation Officer, and the Advisory Council on Historic Preservation agree that the undertaking shall be implemented in accordance with the [following or attached] stipulations in order to take into account the effect of the undertaking on historic properties.

[Insert stipulations or attach to document]

Execution of this Memorandum of Agreement evidences that the [agency] has afforded the Council a reasonable opportunity to comment on the [undertaking] and its effects on historic properties and that the [agency] has taken into account the effects of its undertaking on historic properties.

Agency Official	Date
-----------------	------

State Historic _____ Date _____
Preservation Officer

Executive Director, ACHP	Date
--------------------------	------

Chairman, ACHP	Date
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AD-A146 612

FEASIBILITY REPORT AND FINAL ENVIRONMENTAL IMPACT
STATEMENT WISCONSIN RIV. (U) CORPS OF ENGINEERS ST PAUL
MN ST PAUL DISTRICT DEC 83

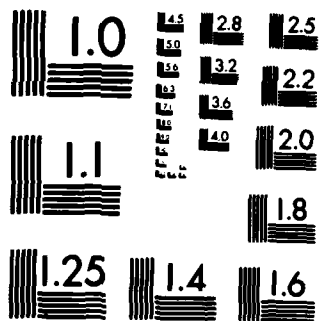
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COPY RESOLUTION TEST CHART

LETTERS REQUIRING NO RESPONSE

The following letters of comment require no Corps response. The comments are noted for the record.



United States Department of the Interior

OFFICE OF ENVIRONMENTAL PROJECT REVIEW
175 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604

September 21, 1983

ER-83/891

Colonel Edward G. Rapp
District Engineer
United States Army Corps of Engineers
1135 U.S. Post Office and Custom House
St. Paul, Minnesota 55101

Dear Colonel Rapp:

The Department of the Interior has reviewed the draft environmental statement and draft main report for flood control at Portage, Wisconsin River, Columbia County, Wisconsin.

The final environmental statement should evidence coordination with and project approval by all state and local agencies and jurisdictions concerned with parklands which will be affected by the proposed project. The final environmental statement should also evidence coordination with and approval by the Wisconsin State Historic Preservation Officer (SHPO) of the Corps of Engineers' completion of compliance with all mandates pertaining to the identification and protection of cultural resources.

The Fish and Wildlife Service concurs with the tentative selected plan--Improvement of the Portage Levee with Modifications to the Existing Alignment. The Service helped develop the plan, and major fish and wildlife concerns were resolved through pre-development consultation.

Thank you for the opportunity to provide these comments.

Sincerely yours,

Sheila Minor Huff
Regional Environmental Officer



United States Department of the Interior

FISH AND WILDLIFE SERVICE

IN REPLY REFER TO:

GREEN BAY FIELD OFFICE (ES)

Univ. of Wisconsin—Green Bay
Green Bay, Wisconsin 54302

September 23, 1983

Colonel Edward C. Rapp
District Engineer
U.S. Army Engineer District
St. Paul
1135 U.S. Post Office & Custom House
St. Paul, Minnesota 55101

Dear Colonel Rapp:

In accordance with our scope of work for Fiscal Year 1983, this supplements our January 14, 1982 Stage III Fish and Wildlife Coordination Act Report and is intended to accompany your Final Feasibility Study Report and Environmental Impact Statement for the Portage Flood Control Project, Columbia County, Wisconsin.

This report is submitted in accordance with the requirements of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). They are also consistent with the National Environmental Policy Act of 1969 and Presidential Executive Orders 11988 and 11990 on Floodplain Management and Protection of Wetlands.

STUDY AREA

The main study area is the Wisconsin River floodplain from the Columbia-Sauk County line near the village of Lewiston, downstream through Portage to the Interstate 90-94 bridge. Also included are portions of Duck Creek and the Baraboo River as affected by Wisconsin River backwater and the Fox River basin as affected by Wisconsin River overflows.

PLAN OF DEVELOPMENT AND IMPACTS

Our previous reports (February 1, 1979, January 16, 1981 and January 14, 1982) provided substantial environmental information and impact evaluations of an array of alternatives considered to reduce flooding of the Wisconsin River at Portage. Through coordination the Service helped develop the "tentatively selected plan" and herewith concurs with it. In our opinion, this plan complies with Executive Orders 11988 and 11990 on Floodplain Management and Protection of Wetlands. Our comments that follow pertain to this plan identified in the draft EIS as Improvements to the Portage Levee with Refinement of the Portage Levee Alignment (PLRA).

Although this plan minimizes adverse effects to fish and wildlife resources, it will cause aquatic habitat losses to the Wisconsin River and also result in losses to Palustrine Forested Wetlands (PFW) and Palustrine Emergent

Wetlands (PEW) adjacent to the river. Principal components of the plan and the habitat losses resulting with the project are discussed by levee section as follows (Figure 1).

Levee Section 1 - loss of 0.2 acres of PFW.

- a. Raise Summit Street between West Carroll and River Streets in Ward 8.
- b. Raise the levee in Pauquette Park between Conant and Edgewater Streets.

Levee Section 2 - loss of 10.7 acres of aquatic habitat in the Wisconsin River.

- c. Place a new levee section along the river from the State Highway 33 bridge downriver to near Dunn Street.
- d. Replace the riverward lock gates of the Portage lock structure and extending the north wing wall by constructing a floodwall upriver approximately 550 feet to just above MacFarlane Road.
- e. Raise and widen the existing levee along its current alignment from the south abutment of the Portage lock structure to Ontario Street.

We do not consider the loss of 0.2 acres of PFW and 10.7 acres of Riverine habitat associated with development of Levee Sections 1 and 2 as significant in terms of their effects on fish and wildlife species. The PFW is a thin riparian strip between the Wisconsin River and Pauquette Park and the Riverine habitat is located adjacent to residential property, downtown Portage. The direct impact area of levee encroachment into the river is a sandy backwater area of the main river. Except during high flows, much of this area is frequently dry throughout the year. During our field inspections, we noted some use of this area by shorebirds but mainly it is used as a beach by local residents.

Levee Section 3 - loss of 41 acres of PFW and 11 acres of PEW.

- f. From Ontario Street downriver to the junction of County Road G and U.S. Highway (USH) 51 and 16, the existing levee alignment would be abandoned and a new levee would be constructed to parallel the south side of the highway. This new levee segment would be approximately 7,700 feet long and 250 feet wide for the 500-year flood event.

The PFW and PEW habitat affected in Levee Section 3 is valuable habitat. However, by moving the levee alignment along STH 51, a larger block of habitat with higher resource values will be preserved, as explained in the following section of this report.

MITIGATION PLAN

In accordance with the U.S. Fish and Wildlife Service's Mitigation Policy,

we classify affected habitats in Resource Category 3, "habitat to be impacted is of high to medium value to evaluation species." Accordingly, the mitigation plan for the tentatively selected plan (PLRA) complies with our mitigation goal of no net loss of habitat value while minimizing the loss of in-kind habitat value.

The primary feature of the PLRA alternative which reduces damages to fish and wildlife resources is the change in a portion of the Portage Levee alignment (Figure 1). As previously stated, the existing levee alignment would be abandoned at Ontario Street and a new levee would be constructed to parallel the south side of STH 51 and terminate at the junction of County Road G and STH 51. Although 41 acres of PFW and 11 acres of PEW will be eliminated by levee construction, the habitat gains far exceed the habitat losses. Routing the levee along STH 51 will cause 185 acres of PFW and 29 acres of PEW to occur riverward of the Portage levee and thus remain in the floodplain and not be susceptible to future development. Improvement of the Portage Levee alternative from Ontario Street to CTH G entirely along its existing alignment would eliminate 81 acres of PFW and PEW habitat and place an additional 126 acres of PFW and PEW habitat landward of the levee. Once landlocked the 126 acres of wetlands would in all likelihood be lost to future development since, with the project, this area would have 500 year flood protection. If this were the case, a total of 207 acres of PFW and PEW habitat would be lost. Thus, the alignment change reduces habitat losses considerably. Fifty-one (51) acres of wildlife habitat will be lost (as opposed to 207 acres) but 214 acres of valuable PFW and PEW habitat adjacent to the Wisconsin River will be preserved.

Enhancement - with the project

Page 37 of the EIS indicated the possible need to evacuate residential property located in the Levee Section 3 area. If the tentatively selected plan were developed the property would not have flood protection over and above existing levee protection. This 29 acre site is surrounded by valuable PEW and if the house must be removed, we recommend the 29 acre lot be excavated to an elevation that corresponds to PEW. The excavated area would provide open water diversity within a dense cattail marsh and enhance the wetland for waterfowl and furbearers. If this were done, 29 more acres of wildlife habitat would be created with the project which would offset the 11 acre PEW loss caused by levee construction. Also, the excavated material may be of suitable quality as fill for the new levees.

Another post construction enhancement measure that should be considered is to seed the levees with grasses that provide dense nesting cover for birds such as ring-necked pheasant, quail and eastern meadowlark. The destruction of ground nesting birds by agricultural machinery is well known. Egg mortality from spring plowing and brood mortality from cutter blades during early summer harvest can be devastating to bird reproductive success. Therefore, if the levees must be mowed timing is critical. A stipulated condition of the Operation and Maintenance Agreement must prohibit mowing the levees until after August 1, when most bird nesting and brood activity is completed. Further, greater nesting success and better habitat suitability would result if mowing was not conducted every year but rather

at three to five year intervals. Residual cover left from the previous year is critical to early spring nesting and thus, would be much denser if not mowed the previous year.

ENDANGERED AND THREATENED SPECIES

Our Stage III report stated that one federally listed endangered species, the peregrine falcon (Falco peregrinus) is known to occur in Columbia County. Since this species is a transient during spring and fall migration and no designated critical habitat occurs in the project area at this time, development of the tentatively selected plan will not effect this species.

This precludes the need for further action on this project as required under Section 7 of the Endangered Species Act of 1973, as amended. Should this project be modified or new information indicates endangered species may be affected, consultation should be (re)initiated.

SUMMARY AND RECOMMENDATIONS

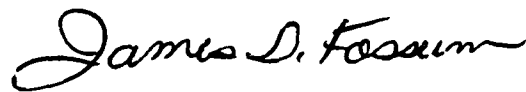
The Fish and Wildlife Service supports development of the tentatively selected plan - Improvements to the Portage Levee with Refinement to the Portage Levee alignment. To accompany this plan, we offer the following recommendations to enhance affected fish and wildlife habitat or otherwise reduce adverse project effects thereon.

1. If the property near Levee Section 3 must be evacuated, 29 acres of wetland habitat should be created by excavating the lot to correspond to the elevation of the adjacent cattail marsh.
2. If the levees must be mowed it should occur on a three to five year cycle. In any event, mowing should not occur prior to August 1.
3. To avoid a potentially heavy silt load to the Wisconsin River, no levee construction should be performed during high flows.
4. Borrow sites for fill material and equipment storage areas should be located on upland sites and avoid environmentally sensitive areas. Disposal sites for unusable excavated material should be similarly located. Interagency coordination among the Service, WDNR, and EPA must occur during advanced design planning to select acceptable sites commensurate with federal, state and local rules and regulations.
5. Unavoidable wetland fills for construction access should be restored to the original wetland contour immediately after project completion.

We trust this report and our previous correspondence will help you develop

the selected plan in an environmentally acceptable manner. We look forward to future input during Advance Design Planning to locate borrow areas and address any other unresolved issues.

Sincerely yours,



James D. Fossum
Acting Assistant Field Supervisor

cc: DuWayne Gebken, WDNR, Madison, WI
Barbara Taylor Backley, US EPA, Chicago, IL

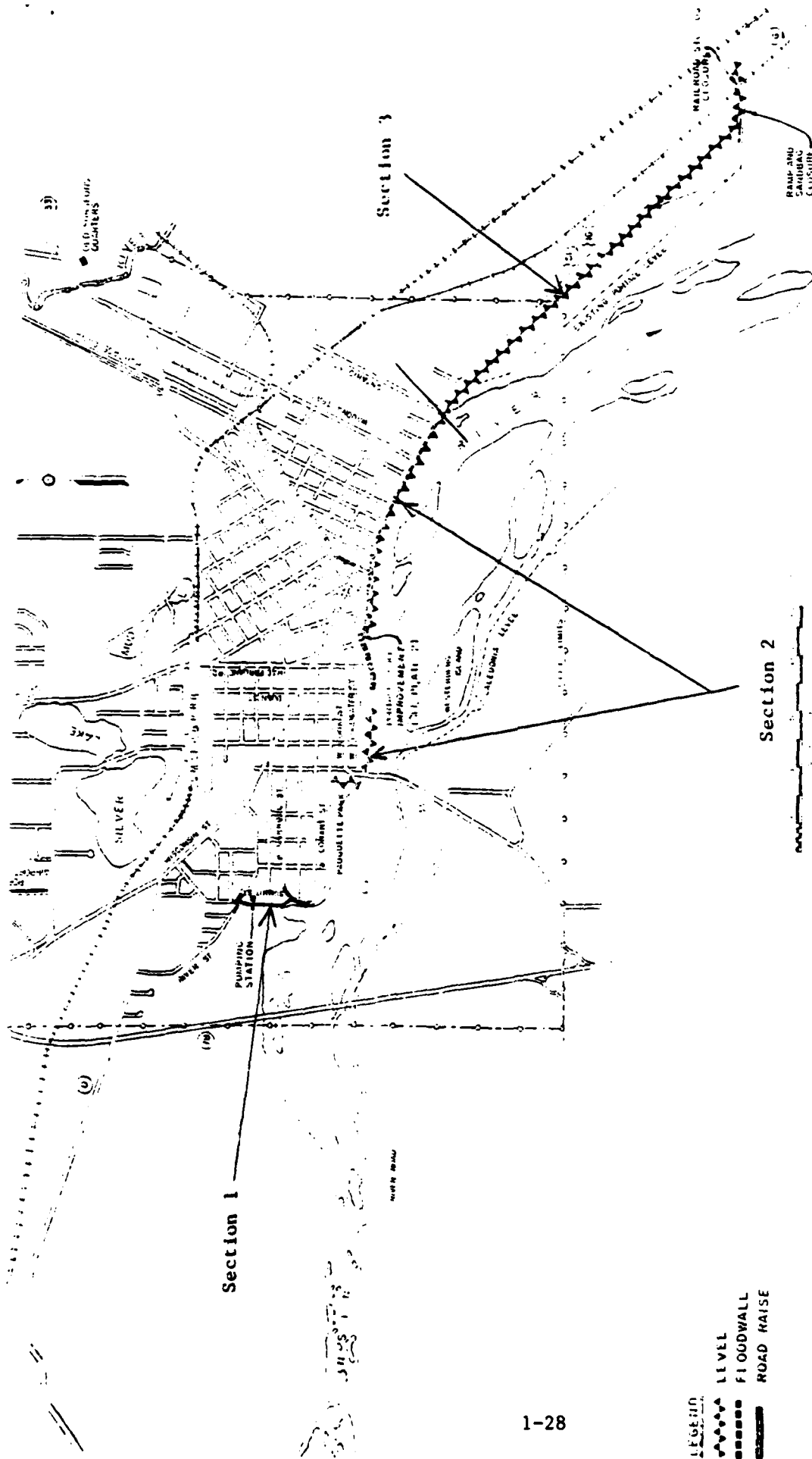


Figure 1. TENTATIVE SUGGESTED PLAN



United States
Department of
Agriculture

Soil
Conservation
Service

4601 Hammersley Road
Madison, Wisconsin 53711

September 1, 1983

Edward G. Ripp, District Engineer
Department of the Army
St. Paul District, Corps of Engineers
1135 U.S. Post Office & Custom House
St. Paul, MN 55101

Dear Colonel Ripp:

We have reviewed your draft main report with draft environmental impact statement for the Wisconsin River at Portage, Wisconsin feasibility study for flood control.

All of our concerns are covered in the report. No Soil Conservation Service projects will be affected by the proposed project.

We appreciate the opportunity to review and comment on the proposed project.

Sincerely,

Clifton A. Maguire
State Conservationist

cc: Peter Myers, Chief, SCS, Washington, D.C.



The Soil Conservation Service
is an agency of the
Department of Agriculture

CITY OF PORTAGE

"Where the North Begins"

● PORTAGE, WISCONSIN

September 30, 1983 53901

MAYOR

Colonel Edward Rapp
District Engineer
U.S. Army Corps of Engineers
1135 U.S. Post Office and Custom House
St. Paul, Minnesota 55101

Dear Colonel Rapp:

We would like to express our support for the Corps of Engineers to be the implementing agency for a local protection levee and floodwall plan at Portage, Wisconsin.

We understand that a non-Federal sponsor must indicate a willingness to financially participate in construction of the project. At this time, we are willing to assume this responsibility. We are aware that the exact amount of our contribution has not been established but we understand it will be at least consistent with traditional requirements of the Corps of Engineers.

Our only concern with the project is the length of time it will take to start construction. We would like to emphasize to you that our support for the project is based upon the need for permanent flood protection within the city and that anything that can be done to expedite the timing of the project would be supported and greatly appreciated by us.

Very truly yours,

Vincent P. Smith, Mayor

VPS:mmm

Advisory Council On Historic Preservation

The Old Post Office Building
1100 Pennsylvania Avenue, NW, #809
Washington, DC 20004

JAN 16 1984

Colonel Edward G. Rapp
Corps of Engineers
District Engineer
1135 U. S. Post Office & Custom House
St. Paul, MN 55101

Dear Colonel Rapp:

Enclosed is the Memorandum of Agreement, ratified by the Chairman, for the flood control project at Portage, Wisconsin. As you know, the ratified Agreement constitutes the comments of the Council and establishes that the Corps has carried out its responsibilities to take into account historic properties as required by Section 106 of the National Historic Preservation Act. A copy of the ratified Agreement has also been sent to the Wisconsin State Historic Preservation Officer.

Your unusually creative proposal, however, has prompted the Chairman to ask that I advise you of our appreciation of your work and effort. Your proposal to construct a new, higher lock gate rather than fill the Portage Canal, meets present and future needs for flood control while respecting the importance of our cultural heritage. Clearly this proposal was not possible without a commitment on your agency's part to seek excellence in its work and to find innovations and solutions where none are obvious. I am pleased to commend you and your staff for this work and to express our respect and gratitude for your effort.

We look forward to working with you on future projects. Again, congratulations for your accomplishment.

Sincerely,



Robert R. Garvey, Jr.
Executive Director

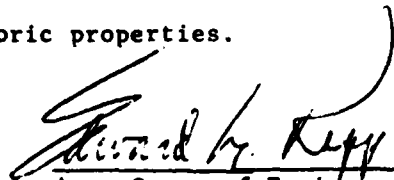
Enclosed: MOA

MEMORANDUM OF AGREEMENT

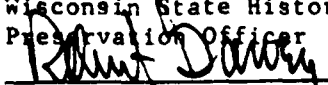
WHEREAS, the U.S. Army Corps of Engineers (Corps) has determined that the proposed flood control project at Portage, Wisconsin, will have an effect upon properties included in or eligible for inclusion in the National Register of Historic Places and has requested the comments of the Advisory Council on Historic Preservation (ACHP) pursuant to Section 106 of the National Historic Preservation Act (16 U.S.C. 470) and its implementing regulations, "Protection of Historic and Cultural Properties (36 CFR Part 800)".

NOW, THEREFORE, the Corps, the Wisconsin State Historic Preservation Officer (SHPO), and the Advisory Council on Historic Preservation agree that the undertaking shall be implemented in accordance with the attached stipulations in order to take into account the effect of the undertaking on historic properties.

Execution of this Memorandum of Agreement evidences that the Corps has afforded the Council a reasonable opportunity to comment on the proposed flood control project at Portage, Wisconsin, and its effects on historic properties and that the Corps has taken into account the effects of its undertaking on historic properties.

 16 Nov 83
Army Corps of Engineers DATE


Chairman, ACHP

Wisconsin State Historic DATE
Preservation Officer
 Dec 20, 1983
Executive Director, ACHP

STIPULATIONS

1. The Portage Lock and Canal will be dealt with in the following manner:

a. Work at the lock will include replacement of the upper set of existing gates. The gates on the upstream end of the lock will be approximately 7.0 feet shorter than the existing gates because of the construction of a concrete sill across the mouth of the lock. This sill provides stability to the floodwall and prevents the lock gates from silting in (see exhibit 1). A 5-foot draft will be maintained between the normal water surface in the lock and the top of the concrete sill. This draft would be ample for small-craft navigation if the lock were to be opened.

b. The new gates will be bolted shut and no opening mechanisms will be provided for in the present design. However, the bearings and struts to the gates will be replaced so that the gates could be made operable at a future date. The new gates will be horizontally framed out and be rivet-bolted so they will have the appearance of the existing riveted gates. If possible, the lifting mechanisms for the filling gates will be salvaged from the old gates; however, new gate hand-rails will replace the old handrails.

c. The concrete in the floodwall will be tinted and streaked to match the existing appearance of the lock.

2. The Zona Gale House property sits at approximately elevation 805. The floodwall will be constructed along the 790-foot contour with the top of the floodwall at elevation 798.7. The floodwall will probably be backfilled for a portion or all of the 8.7-foot height. If the floodwall can be seen from the property, landscaping along the wall will retain the properly landscaped appearance with which Zona Gale was concerned when the house was constructed.

3. The Corps shall ensure that an archaeological survey of previously unassessed portions of the project's area of environmental effect is conducted, taking into account the professional standards identified in the Council's current Manual of Mitigation Measures and in consultation with the SHPO. If the survey results in the discovery of properties that in the opinion of the SHPO may be eligible for the National Register because they potentially could produce information important to the study of history or prehistory, the Corps shall ensure that such properties are treated in accordance with the stipulation regarding archaeological data recovery contained in point 4 of this Memorandum. If the survey results in the discovery of properties which the SHPO believes may be eligible for the National Register for other reasons, the Corps shall request further comments of the Council pursuant to 36 CFR Section 800.6(b).

4. The Corps shall ensure that, based on the principles in Part I of the Council's handbook, Treatment of Archaeological Properties, a plan is developed in consultation with the SHPO specifying: (1) which properties or portions of properties shall be subjected to data recovery; (2) which may be destroyed without such attention; and (3) what research questions shall be addressed by the data recovery effort and in what manner. The Corps shall ensure that the plan is responsive to the guidelines in Part III of the handbook. The Corps shall submit the plan to the SHPO and the Council for 15-day review. Unless the SHPO or the Council objects within 15 days after receipt of the plan, the Corps shall ensure that the plan is implemented.

5. Efforts to design the aforementioned features and any which arise as a result of the cultural resources surveys mentioned in point 3 will be closely coordinated with the Wisconsin State Historic Preservation Office, the Portage Canal Society, and the owners of the Zona Gale House.

[illegible]

SECTION 0-0

SECTION 1-A

PORTAGE CANAL CLOSURE

CITY OF PORTAGE

"Where the North Begins"

● PORTAGE, WISCONSIN
53901

November 30, 1983

DEPARTMENT of PARKS and RECREATION

115 West Pleasant Street
Portage, Wisconsin 53901

Colonel Edward G. Rapp
District Engineer
1135 U. S. Post Office & Custom House
St. Paul, Minnesota 55101

Dear Sir:

I am writing in regard to the Portage Flood Control Project.

Having reviewed the U. S. Army Corps of Engineers Feasibility Study for Flood Control at Portage, Wisconsin dated March, 1983, I have found the Portage Park and Recreation Department is in favor of the proposed recreation features of the project and that we should continue to cooperate with the Corps to develop a plan that both parties will agree on. We also understand that if a mutually agreeable plan is developed, cost sharing agreement responsibilities would have to be negotiated.

If you should have any questions please contact my office.

Thank you for your time and consideration.

Best regards,

J. E. Davis

Jefferson E. Davis
Parks and Recreation Director

JED:lm

cc: Mayor Smith
Michael T. Horkan, City Engineer
Donald F. Anacker, Chairman, Park & Recreation Board



U.S. Department
of Transportation
**Federal Highway
Administration**

Region 5
Illinois, Indiana, Michigan,
Minnesota, Ohio, Wisconsin

18209 Dixie Highway
Homewood, Illinois 60430

August 2, 1983

Col. Edward G. Rapp, District Engineer
Corps of Engineers, St. Paul District
Department of the Army
1135 U.S. Post Office and Custom House
St. Paul, Minnesota 55101

Attention: Plan Formulation Branch
Planning Division

Gentlemen:

Review and Comment
Local Flood Protection Project; Portage, Wisconsin
Draft Environmental Impact Statement, and
Draft Technical Appendices

A coordinated review has been made of the subject draft environmental impact statement and draft technical appendices. From the information provided we conclude that there will be no significant impacts on Federal-aid highway systems resulting from implementation of the project.

We understand that the Wisconsin Department of Transportation has been providing direct coordination with you regarding impacts on transportation facilities and making necessary adjustments to highway facilities. Your continued coordination with that agency should assure that transportation adjustments and related impacts are adequately considered in development of your project.

Sincerely yours,

Lionel H. Wood, Director
Office of Environmental Programs

END

FILED

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